Massachusetts Department of Transportation

NORTHERN TIER PASSENGER RAIL STUDY

- *DRAFT* -

Final Report

August 13, 2024

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CHAPTER 1: EXECUTIVE SUMMARY

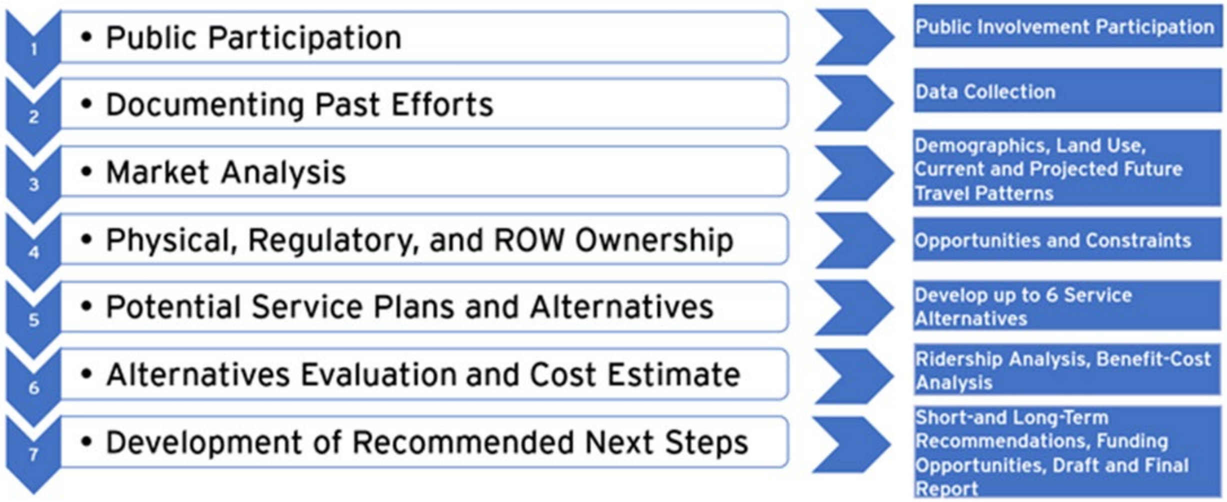
Introduction

The Massachusetts Department of Transportation (MassDOT) was directed by the Massachusetts Legislature to conduct a feasibility study to examine the benefits, costs, and investments necessary to implement new passenger rail service that would be a competitive travel option along the Northern Tier, connecting North Adams, Greenfield, and Boston.

In fulfillment of the directive, the Northern Tier Passenger Rail Study aimed to:

- Engage the Working Group, study stakeholders, and the public;
- Assess historic, current, and forecasted future conditions;
- Develop and examine potential service alternatives that could connect communities along the corridor; and
- Identify potential recommendations and next steps.

Figure 1.1: Study Process


1
• Public Participation
Public Involvement Participation
2
• Documenting Past Efforts
Data Collection
3
• Market Analysis
Demographics, Land Use, Current and Projected Future Travel Patterns
4
• Physical, Regulatory, and ROW Ownership
Opportunities and Constraints
5
• Potential Service Plans and Alternatives
Develop up to 6 Service Alternatives
6
• Alternatives Evaluation and Cost Estimate
Ridership Analysis, Benefit-Cost Analysis
7
• Development of Recommended Next Steps
Short-and Long-Term Recommendations, Funding Opportunities, Draft and Final Report

The study process illustrates a series of steps that build upon each other to develop a set of potential passenger rail service alternatives using a two-phased approach; these alternatives were evaluated against the study goals and objectives using criteria that measured the effectiveness of the service alternatives.

In collaboration with the Working Group, stakeholders, and the public, the following goals and objectives were identified for the study:

Goal: Support economic development along the Northern Tier corridor
Objectives:

- Improve connectivity and access to destinations (e.g., jobs and services, academic institutions, tourist attractions, etc.)
- Support the advancement of relevant economic development-related policies, plans, and designations
- Minimize impacts to freight rail operations

Goal: Minimize impacts on public health and the environment from transportation
Objectives:

- Improve public health outcomes

- Minimize air/noise pollution and greenhouse gas emissions
- Minimize or avoid impacts to cultural or natural resources

Goal: Promote transportation equity
Objectives:

- Increase mobility options between Western and Eastern Massachusetts
- Improve connectivity and reliability
- Enhance safety

Seven evaluation criteria were utilized to evaluate the ways in which the service alternatives met the outlined goals and objectives:

- Mobility and access
- Economic impact
- Social equity and fairness
- Impacts on rail capacity
- Environmental and cultural resources
- Cost effectiveness
- Safety and air quality

Alternatives Development and Evaluation

To illustrate a range of possible options for new intercity rail service along the corridor, alternatives were developed and evaluated based on the established goals, objectives, and evaluation criteria, as well as identified challenges and opportunities. Using a two-phase alternatives development approach, the process began with the development and evaluation of two service alternatives representing lower investment and higher investment scenarios. With feedback from the Working Group and the public, the two potential initial services alternatives were refined, and four additional alternatives were developed and assessed as part of Phase 2.

Alternatives Development

Phase 1 of the alternatives development process began with an assessment of existing right of way conditions and travel patterns in order to develop the initial two service alternatives. Each alternative consists of a combination of infrastructure and service characteristics including stations, service structure, frequency of service, travel times, and physical improvements (outlined in Figure 1.2).

Figure 1.2: Service Characteristics

Ingredient	Range of Options
Stations	• Increase or decrease number of stations • Locations could change
Coverage Area	• Limited to Massachusetts vs. extended into Vermont and New York
Service Structure	• Direct service to Boston vs. transfer to other services (e.g., MBTA Commuter Rail, Valley Flyer)
Frequency of Service	• Increase or decrease number of daily trains
Span of Service	• Full day service vs. commuter peak • Daily vs. seasonal
Travel Time Between Stations	• Existing freight train speeds to full high-speed rail (slow to very fast)
Physical Improvements	• Incremental State of Good Repair, full reconstruction in existing alignments, new alignments

Physical Improvements

Physical improvements are the construction of track and other system upgrades (e.g., signal) to increase train speeds or improve operations. Examples of this include replacement of railroad ties and realigning track curves. All of the alternatives assume that Northern Tier passenger rail service would share the corridor with MBTA Commuter Rail service and PAS freight service. Another infrastructure element is the rail vehicle fleet. All infrastructure improvements are assumed for the PAS trackage between Fitchburg and North Adams; no improvements were assumed for the MBTA Fitchburg Line. Both alternatives include a train storage facility in North Adams.

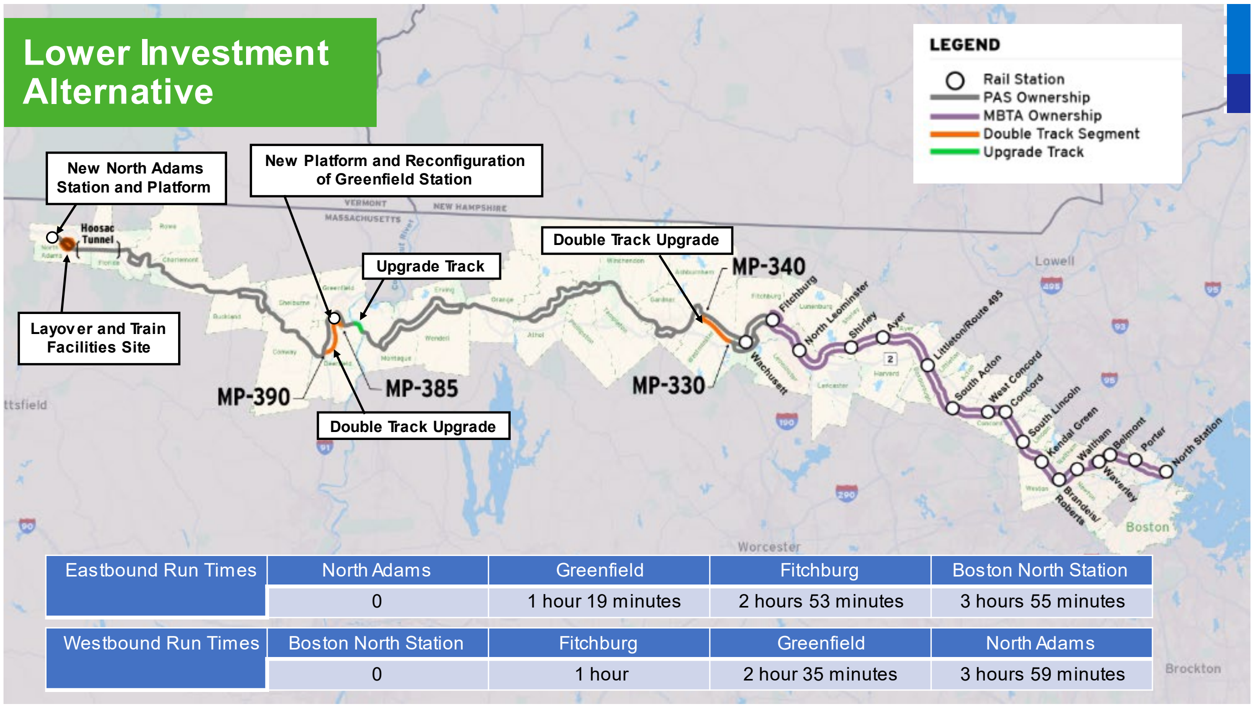
Phase 1 Alternatives

As part of Phase 1, two initial alternatives were designed to demonstrate the types of service that could result from different levels of infrastructure investment. Alternative 1 (the lower investment alternative) minimizes the level of infrastructure investment, while Alternative 2 (the higher investment alternative) identifies investments that could enable travel times equivalent to motor vehicle travel times from North Adams to Boston. The main elements of the initial service alternatives are similar with some key exceptions. The trains serve Boston North Station, Fitchburg, Greenfield and North Adams. The same rolling stock, comparable to the Amtrak Valley Flyer trains, is assumed for both alternatives. Both alternatives have five round trips per day, seven days per week serving similar trip purposes.

Alternative 1: Lower Investment

Improvements included in Alternative 1 are the minimum steps necessary to operate passenger trains, eliminate the low-speed segments that would have significant impacts on travel times, and create additional track capacity to accommodate planned operations, as shown in Figure 1.3. Alternative 1 would take 3 hours and 55 minutes traveling from North Adams to Boston North Station.

Figure 1.3: Lower Investment Alternative



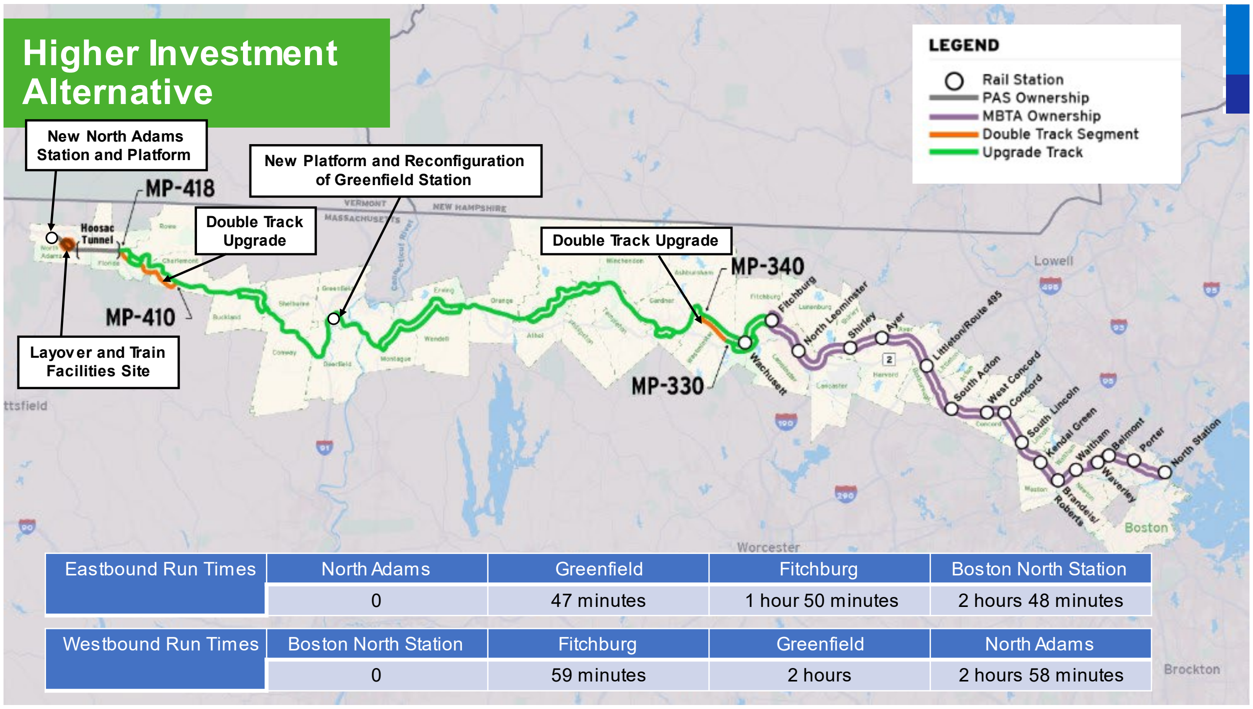
Eastbound Run Times	North Adams	Greenfield	Fitchburg	Boston North Station
	0	1 hour 19 minutes	2 hours 53 minutes	3 hours 55 minutes

Westbound Run Times	Boston North Station	Fitchburg	Greenfield	North Adams
	0	1 hour	2 hour 35 minutes	3 hours 59 minutes

Alternative 2: Higher Investment

The infrastructure improvements in Alternative 2 includes further track improvements to support superelevation and increase the track class to support enhanced capacity from Fitchburg to North Adams. Additional double tracking is built in Westminster, Rowe, and Charlemont. These improvements improve trip time and efficiency. Alternative 2 would take 2 hours and 48 minutes from North Adams to Boston North Station, as shown in Figure 1.4.

Figure 1.4: Higher Investment Alternative



Eastbound Run Times	North Adams	Greenfield	Fitchburg	Boston North Station
	0	47 minutes	1 hour 50 minutes	2 hours 48 minutes

Westbound Run Times	Boston North Station	Fitchburg	Greenfield	North Adams
	0	59 minutes	2 hours	2 hours 58 minutes

Phase 2 Alternatives

The Phase 1 service alternatives and the evaluation results were presented at a public workshop in January of 2023. Following an overview of the study process, the public workshop featured three modules that reviewed the alternatives development process, the evaluation of Phase 1 alternatives and a lookahead to Phase 2.

Each module included a presentation followed by discussion, questions, and answers. Poll questions were used to engage workshop attendees about trip purposes, service benefits, and tradeoffs related to the potential characteristics of four additional service alternatives to be developed in Phase 2, including stations, frequency of service etc.

During and following the public workshop, stakeholders provided feedback on the Phase 1 alternatives and input for the development of the Phase 2 service alternatives. Requests included additional stations (e.g., Shelburne Falls and Porter Square); a connection to Albany, NY; electrification of the passenger rail service; and seasonal stops.[1] The characteristics of the Phase 2 alternatives were developed based on the feedback received.

Overview of Phase 2 Alternatives

Alternative 2 was a base for the four additional service alternatives. Phase 2 service alternatives each provide five round-trips, seven days per week. Each alternative uses coaches comparable to those used on the Valley Flyer service. The schedule times for the trains in each alternative are also similar. All alternatives use diesel locomotives except for Alternative 3, which uses electrified locomotives. Alternatives 3, 4, and 5 provide a one-seat ride on five round trips per day serving a variety of trip purposes. Alternative 6 requires a transfer between the Northern Tier and MBTA Commuter Rail services at Fitchburg. Infrastructure improvements between Fitchburg and North Adams are comparable in magnitude and impact but vary by location. Stations vary for all Phase 2 alternatives. A North Adams layover is included in all alternatives except Alternative 5 Albany.

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[1] Seasonal stops are added to the schedule to support seasonal attractors (e.g., weekend stops at Wachusett during the ski season.

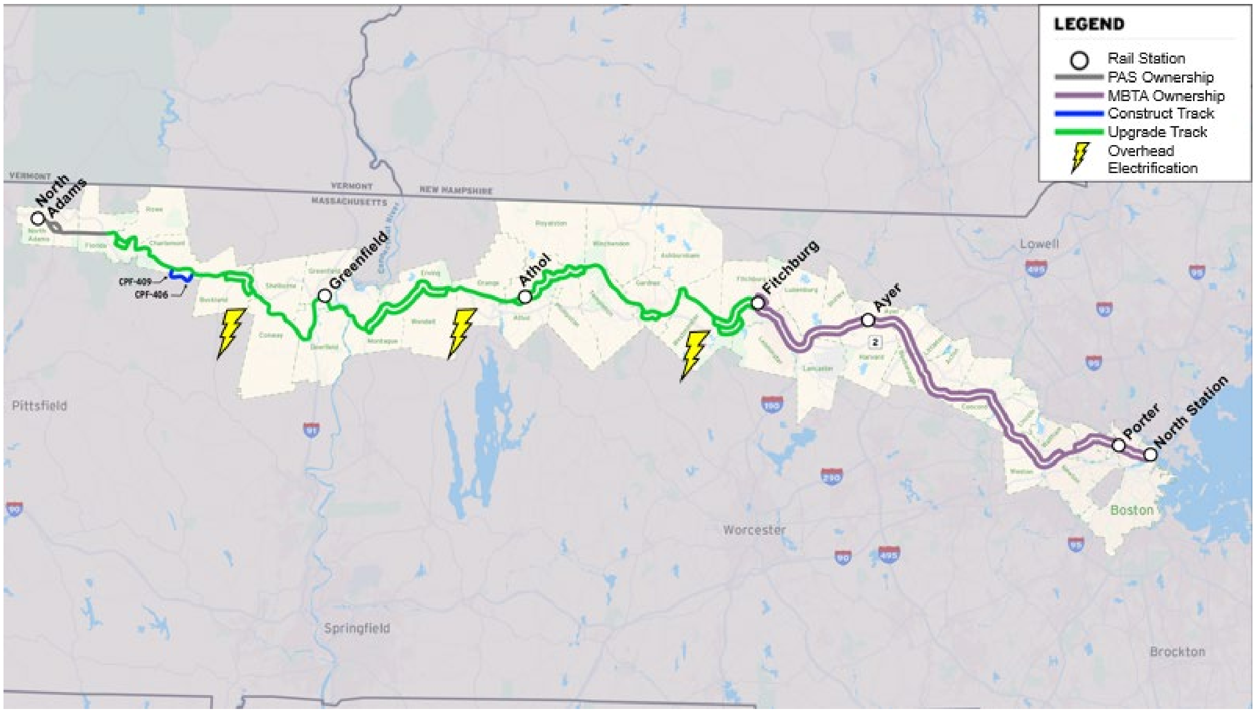
All Phase 2 alternatives include upgrades of the track from Class 3 to Class 4, crossing renewals, bridge rehabilitation, signal replacement and Positive Train Control, new stations and platforms particular to each alternative, and a new platform and reconfiguration of Greenfield Station.

The added station stops would allow for more travel within the corridor and serve major job centers such as Devens (via Ayer Station) and Kendall Square in Cambridge (via MBTA Red Line service from Porter Station).

Alternative 3: Electrified Service

Alternative 3 includes electrification of the right-of-way between Fitchburg and North Adams with overhead catenary system and associated power substations. This alternative assumes that electrification from Fitchburg east would be completed by the MBTA. Alternative 3 would include North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter, and North Station as station stops. Other infrastructure improvements would include new double track in Charlemont. Travel time from North Adams to Boston would be 2 hours and 50 minutes.

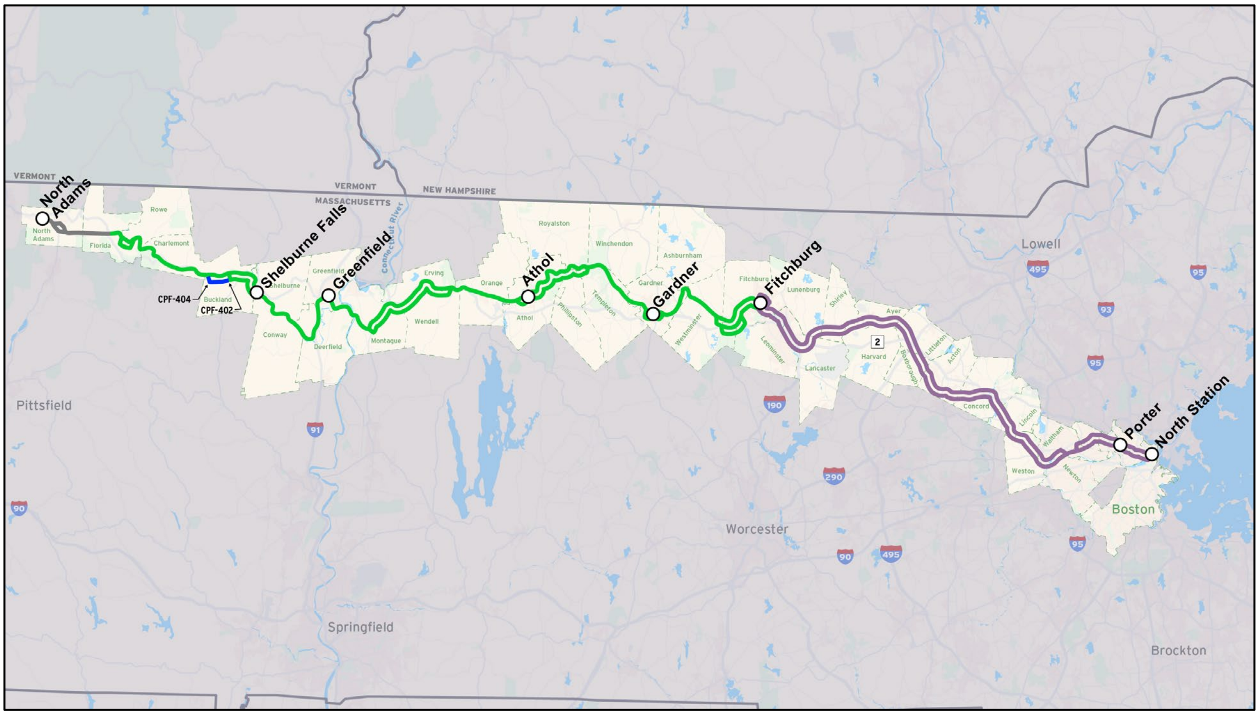
Figure 1.5: Map of Alternative 3 - Electrified Service



Alternative 4: Full Local Service

Alternative 4 would add stops at Shelburne Falls, Athol, Gardner, and Porter. Travel time from North Adams to Boston would be 2 hours and 59 minutes. Other infrastructure improvements would include a new double track in Charlemont.

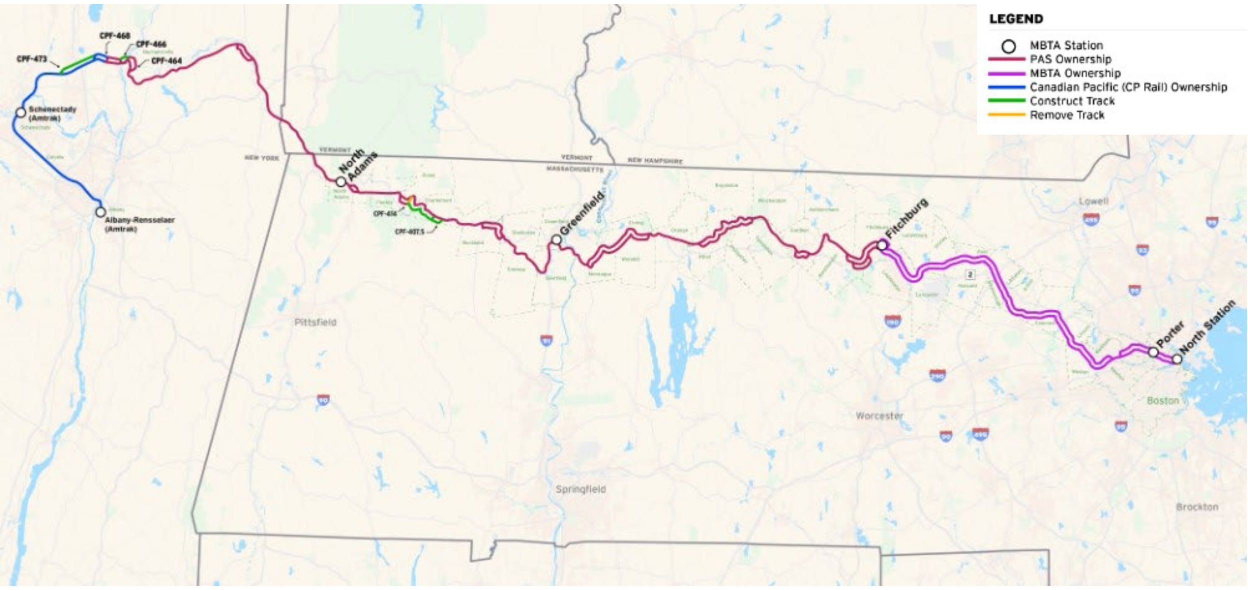
Figure 1.6: Map of Alternative 4 - Full Local Service



Alternative 5: Albany Extension

Alternative 5 assumes limited track additions for New York State. Instead of starting at North Adams, this service would run from Albany, New York, to Boston North Station. It also includes stops at Schenectady, NY, North Adams, Greenfield, Fitchburg, and Porter. The schedule would be optimized for transfers to other rail services at Albany/Rensselaer. Travel time from North Adams to Boston would be 2 hours and 49 minutes. Travel time from Albany, New York, to Boston North Station would be 4 hours and 34 minutes. Operating speeds between North Adams and Albany, NY are not included. Equipment for this service would layover at the existing Amtrak facility in Rensselaer, NY.

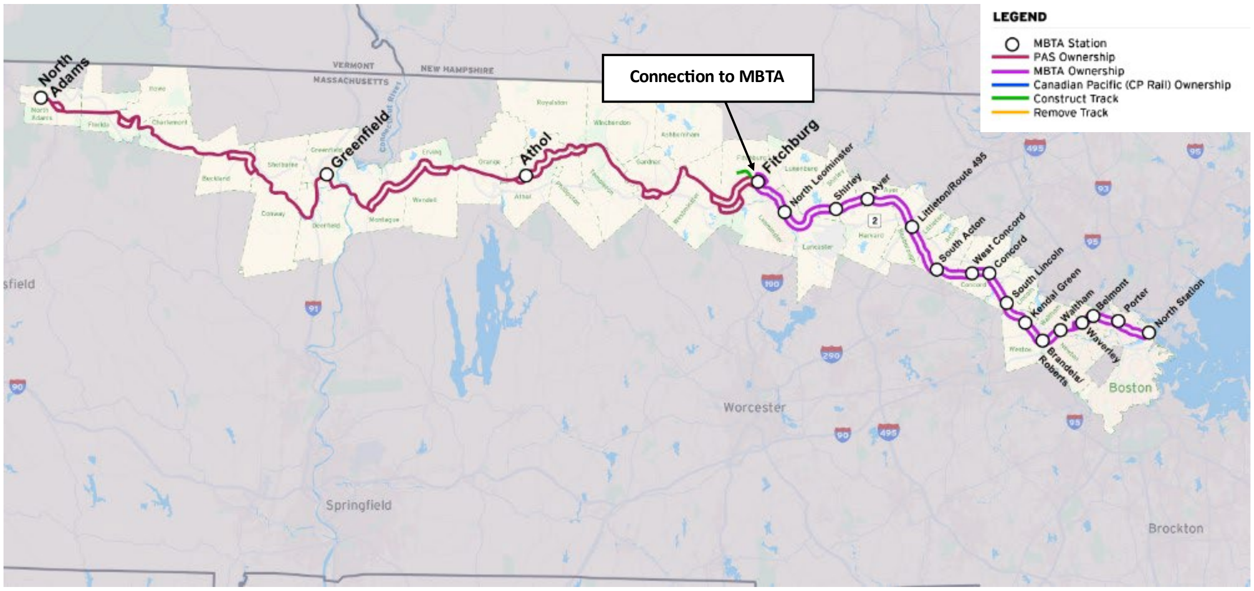
Figure 1.7: Map of Alternative 5 - Albany Extension



Alternative 6: Northern Tier Rail Link

Alternative 6 is a two-seat ride with a connection between Northern Tier trains and MBTA Commuter Rail Trains at Fitchburg. This alternative would add a stop at Athol. Travel time from North Adams to Boston would be 3 hours and 22 minutes.

Figure 1.8: Map of Alternative 6 - Northern Tier Rail Link



Evaluation of Phase 2 Alternatives and Refinements of Analysis

Refinement is a critical component of the study process. Based on comments and questions from the Working Group and the public, clarifications, and updates to the assumptions for ridership forecasting, cost estimation, and other elements were made. The refinements to the Phase 1 alternatives and the Phase 2 alternatives development and evaluation were presented at Working Group and public meetings in October of 2023.

Figure 1.9: Evaluation Summary

Evaluation Criteria	**Alt. 1 – Lower Investment**	**Alt. 2 - Higher Investment**	**Alt. 3 – Electrified Service**	**Alt 4. - Full Local Service**	**Alt. 5 - Albany Extension**	**Alt 6. – Northern Tier Rail Link**
Frequency	5 Trains per day	5 Trains per day	5 Trains per day	5 Trains per day	*5 Trains per day*	5 Trains per day
Coverage Area and Populations Served	North Adams, Greenfield, Fitchburg, North Station	North Adams, Greenfield, Fitchburg, North Station	North Adams, Greenfield Athol, Fitchburg, Ayer, Porter, North Station	North Adams, Shelburne Falls, Greenfield Athol, Gardner Fitchburg, Porter, North Station	*Albany (NY) Schenectady (NY) North Adams, Greenfield, Fitchburg, Porter, North Station*	North Adams, Greenfield, Fitchburg, MBTA Commuter Rail Stations (via Transfer at Fitchburg)
Eastbound Travel Times North Adams to Boston	3 hours, 48 mins	2 hours, 48 mins	2 hours, 50 mins	2 hours, 59 mins	*2 hours, 49 mins*	3 hours, 22 mins
Greenfield to Boston	2 hours, 31 mins	2 hours, 0 mins	2 hours, 4 mins	2 hours, 8 mins	*2 hours, 2 mins*	2 hours, 34 mins
Maximum Speeds	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)
Environmental Impacts	Minimal	Minimal	Minimal	Minimal	*Minimal*	Minimal
Passenger Rail Impacts	None	None	None	None	*None*	None
Freight Rail Impacts	Minimal delay estimated	Minimal delay estimated	Minimal delay estimated	Minimal delay estimated	*Delays west of North Adams TBD*	Minimal delay estimated
Community/Safety Impacts **Grade Crossings Impacted**	69 crossings	69 crossings	69 crossings	69 crossings	*119 crossings*	69 crossings

* The average time travel by car between North Adams and Boston is 2 hours and 48 minutes, between Greenfield and Boston 2 hours and 8 minutes

* Schedules were built with the goal to minimize conflicts with freight rail service and to create no conflict with MBTA service

Figure 1.10: Evaluation Summary

Evaluation Criteria	Alt. 1 – Lower Investment	Alt. 2 - Higher Investment	Alt. 3 – Electrified Service	Alt 4. - Full Local Service	Alt. 5 - Albany Extension	Alt 6. – Northern Tier Rail Link
Estimated Annual Ridership	65,880 to 111,460	100,780 to 148,200	196,520 to 304,200	168,040 to 255,460	100,340 to 149,160	3,900 to 23,900
Capital Cost Per Mile	$6,187,280	$11,064,097	$20,609,150	$11,200,458	$8,803,744	$10,969,819
Capital Cost Per Rider	$7,882 to $13,336	$10,601 to $15,589	$9,620 to $14,891	$6,225 to $9,464	$13,161 to $19,565	$65,176 to $399,413
Operating and Maintenance Cost Per Rider	$ 265 - $449	$ 200 - 294	$97 - $151	$116 - $176	$311 - $462	$1,941 – 4,950
Transportation Cost Savings[1] Low Ridership	$734,353	$3,756,019	$6,274,625	$5,840,958	$3,784,831	$140,113
High Ridership	$1,932,315	$4,749,951	$8,151,215	$7,617,419	$4,846,631	$714,576
Annual VMT Reductions Low Ridership	3,481,260	7,651,340	11,868,826	11,531,674	7,749,424	283,408
High Ridership	6,040,280	10,539,688	17,322,166	16,694,040	10,834,998	1,952,786
Economic Impacts from Construction[2] Output (in millions)	$1,206 over 3 years	$2,263 over 4 years	$4,298 over 4 years	$2,337 over 4 years	$2,834 over 4 years	$2,285 over 4 years
Peak Employment (direct, indirect + induced)	2,679 jobs	3,763 jobs	7,167 jobs	3,980 jobs	4,745 jobs	3,857 jobs

Notes:

1. Defining Transportation Cost Savings: Parking, fuels, tolls, etc.
2. Alt. 1 duration is 3 years due to smaller scale of infrastructure modifications

Figure 1.11: Total Capital and Operations & Maintenance Costs

Alternative	Total Capital Cost	Total Annual Operations and Maintenance Cost*
Alternative 1 – Lower Investment	$878,593,696	$29,584,447 ($256 - $449 per rider)
Alternative 2 – Higher Investment	$1,571,101,755	$29,584,447 ($200 - $294 per rider)
Alternative 3 – Electrified Service	$2,926,449,410	$29,584,447 ($97-$151 per day)
Alternative 4 – Full Local Service	$1,590,465,076	$29,584,447 ($116 - $176 per rider)
Alternative 5 – Albany Extension	$1,963,234,923	$46,388,580 ($311 - $462 per rider)
Alternative 6 – Northern Rier Rail Link	$1,557,714,406	$19,305,989 ($1,941 - $4,950 per rider)

Note: Annual Operating and Maintenance Costs calculated based on length of operating service

A Benefit-Cost Analysis is a common methodology, often used in federal funding processes, for evaluating the impacts of a potential investment through an economic lens. For the Northern Tier, key benefits include safety, avoided emissions, and property value increases. Project costs include the capital costs necessary to construct the service, and operations and maintenance costs.[2] The benefit-cost analysis quantifies some aspects of the relative merits of the alternatives.

Figure 1.12: Benefit-Cost Analysis

Benefit-Cost Metric	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5
Safety Benefits	$2.3	$3.8	$6.1	$6.2	$3.8	$0.1
Avoided Road Wear and Tear	~$0.0	$0.1	$0.1	$0.1	$0.1	~$0.0
Avoided Congestion	$2.0	$3.3	$5.4	$5.4	$3.3	$0.1
Avoided Emissions (except CO2)	- $0.2	- $0.1	$0.1	- $0.1	- $0.2	- $0.1
Avoided Emissions (C02 only) *	$0.8	$1.3	$2.4	$2.2	$1.3	~$0.0
Property Value Increase	$21.9	$20.5	$27.9	$42.6	$20.5	$31.9
Total Benefits	- $238.8	- $209.5	- $164.5	- $167.0	- $358.7	- $150.6
Total Costs	$542.1	$941.7	$1,701.3	$953.4	$1,177.8	$964.5
Net Present Value	- $780.9	- $1,151.2	- $1,865.8	- $1,120.4	- $1,536.5	- $1,115.1
Benefit-Cost Ratio	**- 0.44**	**- 0.22**	**- 0.10**	**- 0.18**	**- 0.30**	**- 0.16**
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5

* Discounted at 3% rate
Note: In millions of 2021 $
Note: A ratio of 1.0 or higher makes a project more competitive for discretionary grants under current federal rules

Each of the six alternatives could provide economic benefits for the region, in proportion to the magnitude of the total project costs. Schedules and service that attract riders could be created to minimize interference with existing freight and passenger rail service. Most of the alternatives remain primarily within the existing right-of-way, which should minimize environmental permitting issues.

Key Findings

The following travel patterns were identified along the corridor.

- The majority of daily trips stay within the segment of the Northern Tier corridor from which they originate.
- The East segment shows a strong orientation toward communities in and around Boston. The Central segment shows Fitchburg, Leominster, and Gardner as the top three destinations for trips originating in the segment. The West segment has a strong north-south

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[2] The conventional BCA approach using Federal guidance results in negative benefits due to the requirement to count operating and maintenance (O&M) costs as disbenefits, rather than as costs. For ease of understanding the outcome of the BCA, this modified approach counts O&M as costs rather than disbenefits.

orientation for trips, suggesting that many people living in the region travel to Pittsfield and Springfield for work, medical care, or other trip purposes.
- West of I-495, travel in the corridor is predominantly by motor vehicle use.
- Typical travel time between North Adams and Boston ranges from 2.5 to 3 hours.

With respect to the potential service alternatives, while all of the service alternatives provide connectivity, mobility, and transportation choice in the Northern Tier corridor, Alternative 3 (Electrified Service) and Alternative 4 (Full Local Service) achieve the highest ridership levels of the six potential alternatives. Alternative 3 is estimated to have its estimated annual ridership range between 196,520 and 304,200 riders. Alternative 4 is estimated to have its estimated annual ridership range between 168,040 and 255,460 riders.

Higher ridership levels represent more reductions in vehicle miles travelled (VMT) and equate to reduced automobile emissions and crashes. Alternatives 3 and 4 also lead this ridership-based metric of the six service alternatives examined.

Alternative 3, with its extensive electrification infrastructure, has the highest total capital cost with accompanying economic benefits.

The community and safety impacts are the same for all alternatives except the Albany Extension Alternative 5, which has more grade crossings over its longer route. The other alternatives have the same number of crossings and trains and therefore the same safety exposure.

The lowest annual cost of operations and maintenance per rider are associated with Alternative 3 and Alternative 4. These alternatives are more expensive to design and build, but more cost effective to operate and maintain because they are estimated to have the highest ridership of the six alternatives.

Stakeholders have expressed support for Alternative 3 and Alternative 4, as well as Alternative 5 (Albany Extension) and have expressed interest in additional stops along the corridor (e.g., Williamstown and Charlemont).

Conclusions

While the fundamental scale of ridership and cost is established, more work would be needed to further develop the markets, ridership, costs and benefits from a transportation planning perspective. The benefit-cost analysis detailed in Chapter 4 indicates the challenges presented in applying for and receiving federal funding under current discretionary grant program criteria.

This assessment reveals a complex set of opportunities and challenges with these key conclusions:

1. Based on current demographic and economic trends, much of the projected ridership is concentrated east of Fitchburg.

2. Due to the timeline for implementing any passenger rail service corridor, mobility improvements should be explored that could provide connectivity in the shorter term. Coordinated regional and municipal planning to support rail service implementation should be undertaken.

3. The rail along the Northern Tier corridor is a strategic asset for the entire Commonwealth and should be treated as such. Given the competitive options for freight service that this

route offers, the societal and environmental benefits of freight rail, as well as utility for mitigating increasing climate risks, ensuring a long-term future for this route is warranted.

Recommended Next Steps

Stakeholders recognize the importance of and the opportunities for the Northern Tier region to help advance economic and transportation development that benefits the entire Commonwealth. Therefore, a series of next steps should be considered to continue enhancing regional mobility and connectivity.

Funding would be necessary to enact these recommendations.

Continue to improve understanding of travel demand along the Northern Tier corridor, corridor segments, and linkages to key regional destinations - In particular, the analysis identified two important gaps: key drivers of travel demand in the corridor and the New York City travel market to northern Berkshire County.

More granular and current Northern Tier travel data, including any COVID-19 pandemic-induced changes, would be beneficial. This could include a closer examination of traffic associated with communities in Vermont and New Hampshire and with area academic institutions. Understanding the Albany market could affect the potential for western section of the Northern Tier.

Advance planning efforts at the intersection of economic development needs and opportunities and serving travel demand - The creation of a coordinated economic development strategy for the Central and Western sections of the Northern Tier would provide a platform to realize sustainable economic growth in the region by leveraging investment in intercity public transportation.

Explore scheduled motor coach service to Northern Tier corridor destinations - Motor coach service can be a relatively low cost means of improving mobility and developing demand for any future rail service.

Evaluate alternative phasing or implementation strategies - Most of the Northern Tier corridor is served by regional transit authorities, with a focus on serving the needs of their immediate service area. In May of 2024, MassDOT awarded a Regional Transit Innovation Grant (RTIG) to a joint effort by Berkshire Regional Transit Authority (BRTA), Pioneer Valley Transit Authority (PVTA), and Franklin Regional Transit Authority (FRTA) which aims to rehabilitate seven buses and operate a commuter bus network to increase regional connectivity between BRTA, PVTA, and FRTA. Such enhancements and further coordination among these services would improve intra-corridor mobility and connectivity, while also offering the potential for improved efficiency.

Evaluate express service between Fitchburg and Boston - Implementation of express service between Fitchburg and Boston could offer a relatively low-cost option to initiate upgraded public transportation and perhaps open access to other sources capital funding for projects such as eliminating the single-track operation through Waltham.

Monitor corridor freight use and trends to explore needs/opportunities for public investment - Federal grant funding offers potential opportunities to advance improvements along the Pan Am Southern corridor, including needed potential projects such as Hoosac Tunnel renewal, bridge strengthening, clearance projects to allow double-stack service, Ayer intermodal terminal improvements, and investments that may mitigate severe damage from flooding caused by climate change. Underlying such an effort will be close coordination with Pan Am Southern ownership, and in the context of a coordinated strategy for rail system improvements on the two east west main lines.

Develop strategies for improving rail connections within the corridor to support economic development, transportation equity, and minimizing impacts to public health/environment - A successful strategy to develop a Northern Tier passenger rail service would require all of these entities and groups to communicate and coordinate effectively, as funding and permitting entities look for unified support for projects. Host railroads and operators apply their resources and efforts to projects with credible strategies and plans.

Policy decisions and strategy are the required next steps to determine if and how the Commonwealth will proceed. These require, at a minimum, continuing effective communication and coordination across all stakeholders.

The existing Compass Rail plan anticipates enhancing connectivity and transportation equity across the Commonwealth. The connection between Greenfield, Springfield, and Boston is in the implementation stages and could be a mechanism to achieve increased west-east mobility.

CHAPTER 2: INTRODUCTION

The Northern Tier Passenger Rail Study is a conceptual planning study assessing rail service alternatives along the North Adams-Greenfield-Boston corridor.

The Massachusetts Department of Transportation (MassDOT) was directed by the Massachusetts Legislature to conduct a feasibility study to examine the benefits, costs, and investments necessary to implement new passenger rail service that would feature the speed, frequency, and reliability necessary to be a competitive option for travel along the Northern Tier of the Commonwealth, connecting North Adams, Greenfield, and Boston.

As excerpted from the fiscal year 2020 budget legislation:

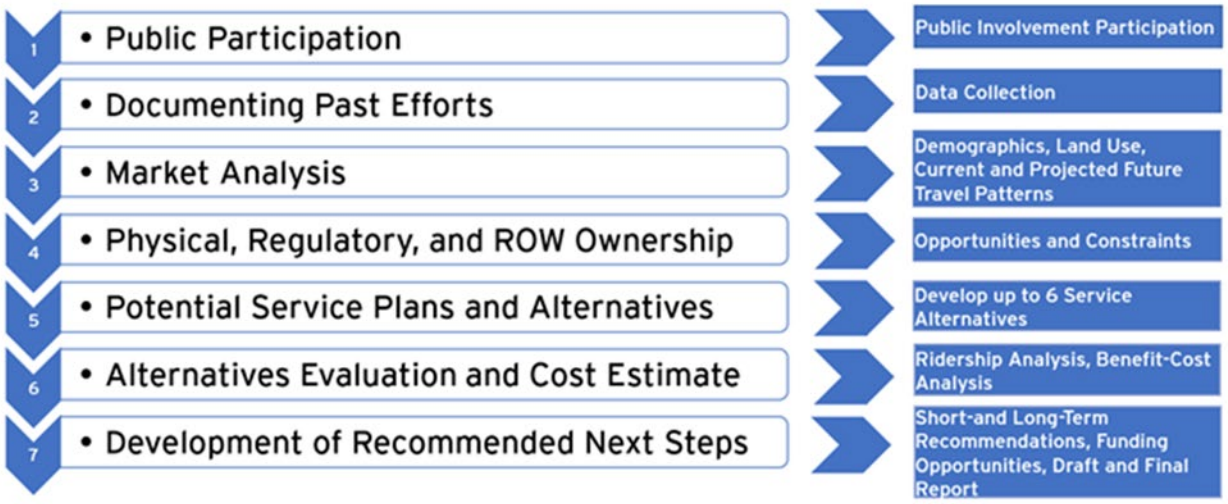
SECTION 84. *Notwithstanding any general or special law to the contrary, the Massachusetts Department of Transportation shall conduct a feasibility study of rail access between the cities of North Adams and Boston.*

> *The study shall examine and evaluate the costs and economic opportunities related to establishing rail service between the cities of North Adams and Greenfield and the cities of Greenfield and Boston including, but not limited to: (i) the projected capital costs; (ii) the projected operating costs and revenue estimates; (iii) the projected ridership levels; (iv) the prospect of operating rail service on existing rights of way and other operational issues; (v) an estimate of the environmental impact and benefits; (vi) an analysis of community impact and benefits; (vii) the potential sources and availability of federal, state, local, and private sector funding; and (viii) the resulting economic, employment, social, and cultural benefits to Franklin and Berkshire counties and the commonwealth as a whole.*

In fulfillment of the directive, the Northern Tier Passenger Rail Study aimed to:

- Engage the Working Group, study stakeholders, and the public;
- Assess historic, current, and forecasted future conditions;
- Develop and examine service alternatives that could potentially connect communities along the corridor; and
- Identify potential recommendations and next steps.

Figure 2.1: Study Process


1
• Public Participation
Public Involvement Participation
2
• Documenting Past Efforts
Data Collection
3
• Market Analysis
Demographics, Land Use, Current and Projected Future Travel Patterns
4
• Physical, Regulatory, and ROW Ownership
Opportunities and Constraints
5
• Potential Service Plans and Alternatives
Develop up to 6 Service Alternatives
6
• Alternatives Evaluation and Cost Estimate
Ridership Analysis, Benefit-Cost Analysis
7
• Development of Recommended Next Steps
Short-and Long-Term Recommendations, Funding Opportunities, Draft and Final Report

The study process illustrates a series of steps that build upon each other to develop a set of passenger rail service alternatives using a two-phased approach; these alternatives were evaluated against the study goals and objectives (described in further detail in the following section) using criteria that measured the effectiveness of the service alternatives. The evaluation criteria have associated measurements that translate goals and objectives into data supporting recommendations on alternatives and next steps for stakeholders and policy makers.

Public Engagement

The Northern Tier Passenger Rail Study involved a robust public involvement process which engaged the study's Working Group and the public through various channels.

Working Group

A Working Group comprised of local, regional, and statewide stakeholders was convened to provide knowledge, expertise, and perspectives based on their respective organizational affiliations and experiences; review study materials and provide feedback; serve as conduits for broader public involvement; and share information with their respective organizations or institutions. Working Group meetings were open to the public and provided opportunities for public comment.

Elected officials, as well as representatives from regional planning and transit agencies, chambers of commerce, advocacy organizations, industry leaders, and additional stakeholders were invited to participate in the Northern Tier Passenger Rail Study Working Group and include:

- Federal, State, and Local Elected Officials
- Federal Railroad Administration
- Western Massachusetts Office of the Governor
- Massachusetts Executive Office of Housing and Economic Development
- 1 Berkshire
- Berkshire Regional Transit Authority
- Berkshire Regional Planning Commission
- North Central Massachusetts Chamber of Commerce
- Franklin Regional Transit Authority
- Franklin Regional Council of Governments
- Montachusett Regional Planning Commission
- Montachusett Regional Transit Authority
- Metropolitan Area Planning Council
- Massachusetts Bay Transportation Authority
- Massachusetts Association of Railroads
- Pan Am Railways
- CSX Transportation
- Transportation for Massachusetts
- TransitMatters
- Fitchburg Line Working Group
- MassDevelopment

As the study began during the COVID-19 public health emergency, all formal meetings were conducted virtually with appropriate accommodations for accessibility. Four virtual Working Group meetings were held in December 2021, June 2022, October 2023, and March 2024. These meetings provided a forum for the Group to discuss priorities, ask questions, and share feedback.

Public Meetings

In addition to the Working Group meetings, three virtual public meetings and a virtual public workshop were held at key study milestones to present information and garner feedback.

At the first public meeting held in July 2022, the agenda included a presentation of the study background and proposed goals and objectives, which included a poll to better understand the attendees' top priorities for the study; a review of past efforts; a discussion of the current conditions of the corridor; and detail on next steps for the study.

In January 2023, a public workshop was held to present the first phase of the alternatives development. The workshop included three modules: Alternatives Development Approach and Methods, Evaluation of Phase 1 Alternatives, and Looking Ahead to Phase 2. Each module concluded with a series of polling questions and discussions for attendees.

The second public meeting in October 2023 provided a study overview and review of the public workshop, a presentation on the Phase 2 alternatives development and evaluation, and an explanation of next steps.

In March 2024, the third public meeting was held to share an overview of the study's background, review the study alternatives, outline issues and opportunities to consider, present draft recommended next steps and draft implementation plan, and garner feedback.

All Working Group and public meeting presentations and meeting summaries, as well as video recordings, were made available on the study website. Documents posted on the website in electronic format were made accessible in compliance with Section 508 of the U.S. Rehabilitation Act of 1973, the Massachusetts General Law Chapter 272 Section 98/98A, and Web Content Accessibility Guidelines.

Stakeholder Briefings

The Northern Tier Passenger Rail Study team held or attended targeted meetings to brief elected officials, regional leaders, and other stakeholders on the study over the course of its duration.

Engagement Tools and Strategies

A Northern Tier Passenger Rail Study website was created and maintained to host information, including a study overview, meeting information and materials, relevant study documents, and contact information. The study website also contained a section where visitors could sign up to receive study updates via email and submit comments and questions through an online comment form. This comment form was hosted through the Public Involvement Management Application (PIMA), a virtual platform used to manage public engagement and study communications. Comments received via PIMA are included in the Appendix. All comments and questions received through the online comment form, email, at meetings, or by letter, were recorded and responses were provided when requested.

PIMA was also used to develop and maintain the study's stakeholder database of over 700 subscribers and to send individual and group emails, including meeting notices. Working Group and public meetings were also advertised via press releases and social media posts.

E-newsletters were disseminated to provide additional information relevant to the Northern Tier Passenger Rail Study including meeting recaps, study process information, and background information on key passenger rail planning and operations-related topics.

Outreach Efforts to Environmental Justice (EJ) Populations

MassDOT's Public Participation Plan, Engage (MassDOT's mapping tool for outreach), and available demographic census data guided the public participation process. Language services, including American Sign Language (ASL) and Communication Access Realtime Translation (CART) services, were secured for a public meeting and the public was able to submit requests for accessibility accommodations or specific language interpretation services in advance of each meeting. The study's online comment form also presented commenters with the option to auto-translate the form into several languages.

Study Goals and Objectives

With the legislation serving as a foundation, and in collaboration with the Working Group, stakeholders, and the public, the following goals and objectives were identified for the study:

Goal: Support economic development along the Northern Tier corridor
Objectives:

- Improve connectivity and access to destinations (e.g., jobs and services, academic institutions, tourist attractions, etc.)
- Support the advancement of relevant economic development-related policies, plans, and designations
- Minimize impacts to freight rail operations

Goal: Promote transportation equity
Objectives:

- Increase mobility options between Western and Eastern Massachusetts
- Improve connectivity and reliability
- Enhance safety

Goal: Minimize impacts on public health and the environment from transportation
Objectives:

- Improve public health outcomes
- Minimize air/noise pollution and greenhouse gas emissions
- Minimize or avoid impacts to cultural or natural resources

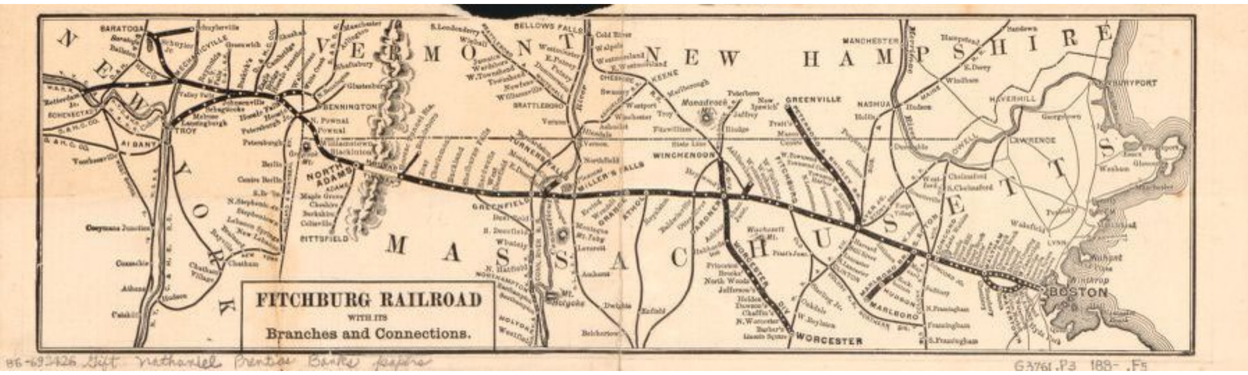
Seven evaluation criteria were utilized to evaluate the ways in which the service alternatives met the outlined goals and objectives:

- Mobility and access
- Economic impact
- Social equity and fairness
- Impacts on rail capacity
- Environmental and cultural resources
- Cost effectiveness
- Safety and air quality

Study Context

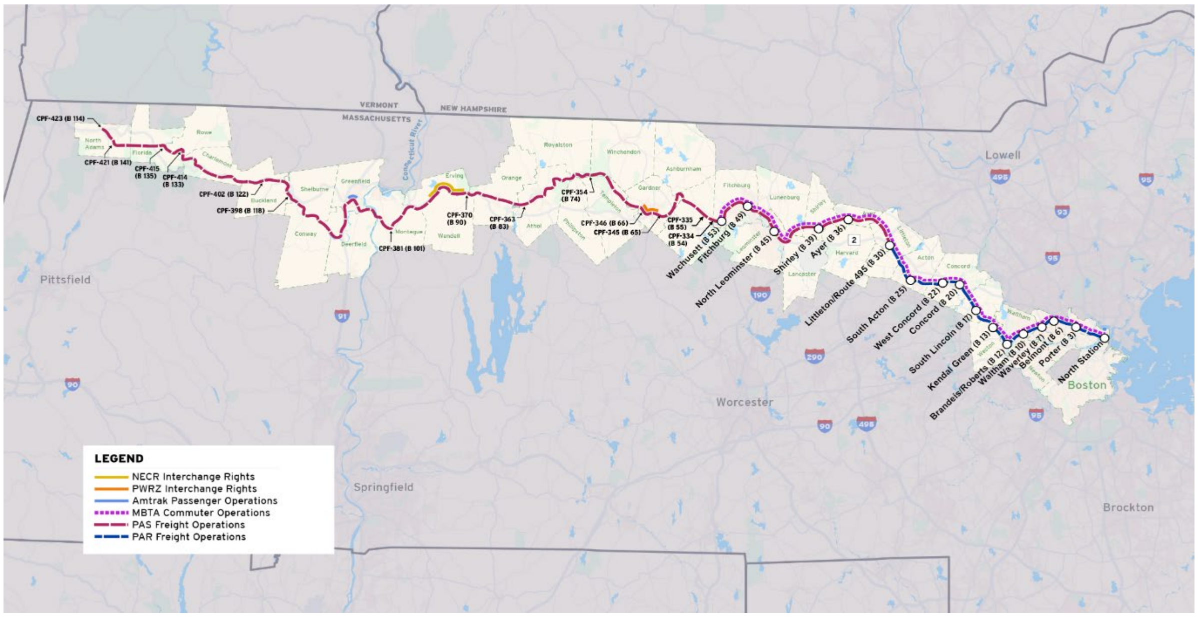
The Northern Tier corridor follows the historical Fitchburg Railroad alignment which began in Boston and extended west to North Adams, then crossed southwestern Vermont and entered New York State. The route was surveyed and constructed in the 1840s to the 1870s and includes the Hoosac Tunnel, the longest tunnel east of the Rocky Mountains, which passes beneath the Hoosac Range – an extension of Vermont's Green Mountains. By proceeding through the mountains instead of over them, the Northern Tier corridor avoids some of the steeper grades required by other routes.

Figure 2.2: Map of the Fitchburg Railroad, circa 1880s - Nathaniel Prentiss Banks map collection, Library of Congress



Passenger rail serviced the corridor from the late 19th century until the mid-20th century. The Massachusetts Bay Transportation Authority (MBTA) maintains passenger rail service at the eastern end of the corridor. Originally restoring commuter rail service to Gardner in 1980, the terminus later shifted to Fitchburg, and then to the current terminus at Wachusett Station in the City of Fitchburg. The Northern Tier corridor from Boston North Station to North Adams extends over 140 route miles and consists of 229.43 track miles when including all controlled track, such as double track and controlled sidings. The current Northern Tier corridor is generally divided into two segments and uses commuter rail and freight, with some overlap of service, ownership, and control. More detailed information on the existing conditions of the corridor is provided in Chapter 3.

Figure 2.3: Map of ownership and control of rail lines along the Northern Tier Corridor



Previous studies relevant to the study corridor are summarized in the following section. The geographic areas for these studies ranged from the individual municipalities to the counties of

Central/Western Massachusetts and contiguous regions in Vermont and Connecticut, as well as Massachusetts statewide and across the Northern New England states. The studies were organized into three major categories:

- Passenger rail studies and other rail and transportation studies
- Regional/municipal transportation plans/studies
- Economic and development studies

Passenger Rail Studies and Other Rail and Transportation Studies

East-West Passenger Rail Study (2021)

The East-West Passenger Rail Study evaluated the potential for implementing passenger rail service from Boston to Springfield and Pittsfield. The report detailed the development and analysis of six potential service alternatives, including the costs, benefits, and investments necessary to advance each concept. The East-West Passenger Rail Study recommended next steps, including coordination and discussion with the host (owner) freight railroad, CSX, which is also part owner of the Northern Tier right of way. Other next steps included more detailed study of economic and community benefits and impacts, the development of a white paper to better understand the governance options for expanded passenger rail in Western Massachusetts, and the evaluation of funding sources and strategies.

Economic Benefits of Regional Rail Investment in Metro Hartford-Springfield (2021)

The Economic Benefits of Regional Rail Investment in Metro Hartford-Springfield study made the business case for completing two proposed rail improvements in the Connecticut Valley region by presenting an analysis examining the economic potential of the Hartford-Springfield region and the ability of enhanced passenger rail service to help achieve that potential. The study examined the completion of the bi-state Hartford Line and potential implementation of the East-West Rail project in Massachusetts.

Other area rail studies that highlighted the value of potential regional connections and the challenges of serving areas with low population density were reviewed. These studies included the *2017 Central Corridor Passenger Rail Feasibility Study* and the *2018 Massachusetts Rail Plan.*

Northern New England Intercity Rail Initiative (NNEIRI) Study (2016)

In 2016, the NNEIRI study examined the opportunities and impacts of more frequent and higher speed intercity passenger rail service on two major rail corridors, the Inland Route (from Boston to Springfield, then continuing to New Haven, Connecticut) and the Boston-to-Montreal Route (from Boston to Springfield, then continuing to Montreal). NNEIRI focused on using east-west service in Massachusetts as a route to the north-south services to New Haven and Montreal, and documented interest in rail transportation and the growing urban and elderly populations.

A Tier 1 Environmental Assessment (EA) for passenger rail improvements in the NNEIRI Corridor was conducted and determined there would be no significant environmental impacts from the NNEIRI Study.

Regional/Municipal Transportation Plans/Studies

Attracting Visitors by Passenger Rail to Franklin County, MA (2017)

The Franklin Regional Council of Governments conducted the study to evaluate travel opportunities following the restoration of passenger rail service to Greenfield in December 2014. Amtrak's

Vermonter train serves Greenfield, connecting it to St. Albans, New York City, Philadelphia, and Washington, D.C. The study documented additional trip opportunities for the new stations in Northampton and Holyoke.

The study concluded that local transportation connections must be accompanied with efforts to enhance the region as a destination:

- Facilitate local transportation options to connect people from the Greenfield station to accommodations and attractions.
- Promote passenger rail service as an option for visitors traveling to the region at the state and local level.
- Continue to promote Franklin County and its assets as a destination for metropolitan-based tourists who live on the Vermonter route and who seek a vacation getaway.

The report also reviewed studies of potential passenger groups and generational travel trends.

Franklin County Regional Transportation Plan 2020

The *2020 Regional Transportation Plan* (RTP) provided a vision for the region and prioritized its needs. The Plan focused on the importance of providing safe, efficient, and resilient mobility for residents and freight, while considering the rural character of Franklin County. The Plan detailed the region's current and future demographic, socioeconomic, and land use patterns, and emphasized several goals including providing residents with transportation option alternatives to the single occupant vehicle, strengthening the local economy and industries, and improving the region's livability and resiliency.

In June 2023, the *2024 Franklin County Regional Transportation Plan* was released, which updated its regional demographic and economic profile, and recommended priorities.

Working Towards the Future (2020)

Working Towards the Future provides a blueprint for the Montachusett region to achieve a multi-modal transportation system that balances the varying needs of its population within the fiscal outlook. The Plan's recommendations include expanded transit, pedestrian, and safety improvements to help the aging population; expanding mode options for the region's commuters; maintaining State of Good Repair (SGR) of the region's infrastructure; extending MBTA Commuter Rail service to Gardner; improving safety and monitoring congestion on the roadway network; and monitoring and assessing environmentally vulnerable infrastructure.

The Plan includes recommendations for MBTA Commuter Rail service to serve key populations more effectively:

- Increase available parking at the Shirley, Ayer, and Littleton Commuter Rail stations.
- Extend train service to Gardner.
- Improve Handicapped accessibility at Shirley and Ayer Train Stations.
- Explore the possibility of a regional facility in the Devens Enterprise Zone.

Journey to 2050, the update of the Montachusett Regional Transportation Plan was endorsed by the MPO in August 2023. The Plan details an analysis of the region and demographic projections, and outlines regional trends, recommendations, and action items.

Economic and Development Studies

Economic Impacts of Fitchburg State University and the Fitchburg Theater Renovation

(UMass Donahue Institute, 2021)
The *Economic Impacts of Fitchburg State University and the Fitchburg Theater Renovation* report quantifies the contribution of Fitchburg State University (FSU) and its alumni to the Massachusetts economy at about $283 million in economic activity as well as 1,776 jobs in fiscal year 2019.

The study anticipates that FSU's spearheading of the initiative to restore the Fitchburg Theater will contribute to the vibrance of the downtown Fitchburg area and introduce economic benefits for the region and the Commonwealth, supporting 43 jobs and $5.3 million in output on an annual basis. FSU is using other components of the Theater Block, including a game studio for FSU seniors in the game design program and the interdisciplinary ideaLab that is used for small business training. Other parts of the building are being renovated for commercial and gallery space.

The study concluded Fitchburg's constellation of downtown development projects, including the Theater, will allow the City to capitalize on its mix of affordability and availability of space for businesses to attract investors and potential residents.

Downtown Business District Assessment and Market Analysis (City of Greenfield, 2021)
This assessment and market analysis of the City of Greenfield's downtown business district informs future revitalization activities and supports an update of the Downtown Revitalization Plan.

The report includes an assessment of real estate and business conditions, a market analysis, and a summary of findings. It documents approximately 251 businesses in Downtown Greenfield and analyzes ownership and types of business such as service, retail, and restaurant, concluding that Downtown is a major employment center with an estimated 2,200 employees.

The existing John W. Olver Transit Center is located within the Greenfield downtown district, which includes approximately 34,778 residents making up 15,446 households.

Devens Economic Profile and Contributions (MassDevelopment, 2020)
Devens, an Army Base until the 1990s, is a center for manufacturing and distribution industries. Occupying the towns of Ayer, Harvard, and Shirley, its space offers opportunities for business expansion with access to highways, and passenger and freight rail services.

According to the *Devens Economic Profile and Contributions* report, the area accounts for 14,000 jobs and contributes upwards of $3.8 billion annually to the Massachusetts economy. As a major employment hub, Devens attracts workers from across the state, southern New Hampshire, and beyond.

Key Findings

The studies assessed provide valuable insight into factors affecting transportation investment and travel decisions. Key takeaways of this review are as follows:

- There is no previous corridor-wide evaluation of travel conditions along Route 2, which is the primary roadway corridor connecting North Adams, Greenfield, and Boston.
- Most transportation planning in the corridor has focused more on local travel.
- Previous studies identify a need for additional transportation options to enhance safety, mobility, and connectivity, and support economic development.
- There is an opportunity for passenger rail service to tie into economic development efforts throughout the study area.
- A better understanding of travel pattern changes due to COVID-19 is needed.

Building upon the goals and objectives of the study, as well as previous efforts, and with the input of the Working Group and the public as a guide, Chapter 3 documents the existing conditions along the Northern Tier corridor including demographic and employment baseline and trends, and current travel markets. Other areas of study include physical characteristics of the rail corridor, right-of-way ownership, the regulatory environment, and governance factors.

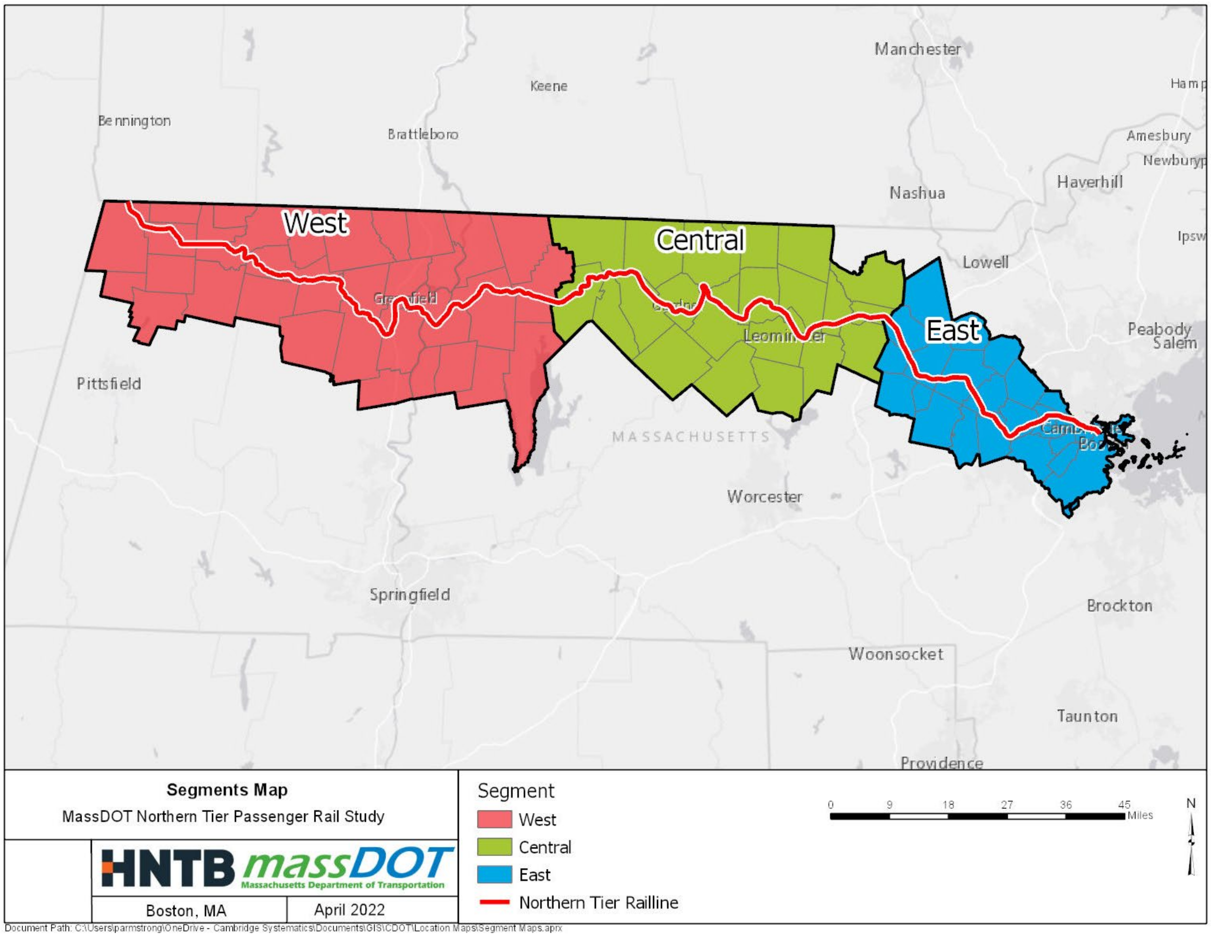
CHAPTER 3: EXISTING CONDITIONS

Central to evaluating the feasibility of implementing passenger service is understanding the existing and projected future conditions along the Northern Tier corridor. This includes the physical conditions on the roadway and rail system and physical and institutional conditions on the existing rail infrastructure. Underpinning the assessment is gaining an understanding of any potential markets that may be served by the potential service.

This chapter reviews past demographic, employment, and travel trends along the corridor to establish baseline projections through 2040. The baseline projections are used to estimate possible changes to travel demand that might arise from the service alternatives.

The analysis divides the region into three segments – West, Central, and East (see Figure 3.1). The West segment includes northern Berkshire and Franklin Counties and includes the cities of Greenfield and North Adams. The Central segment includes the Montachusett region with population centers such as Fitchburg, Leominster, Gardner, and Athol. The East segment includes the population centers of Boston and Cambridge along with their western suburbs.

Figure 3.1: Map of Northern Tier segments



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Freight and Passenger Operations

The Northern Tier right-of-way has two owners. The Fitchburg Line, extending from Boston North Station to the City of Fitchburg, is owned by the Massachusetts Bay Transportation Authority (MBTA). Pan Am Southern LLC (PAS), a Class 2 railroad, owns the corridor west of Wachusett (the MBTA property in Fitchburg) to the state line with Vermont and beyond. Pan Am Southern is equally owned by two Class 1 freight railroads, CSX Transportation (CSX) and Norfolk Southern Railway (NS). CSX acquired its share of ownership through the purchase of Pan Am Railways Inc. (PAR), which was approved by the Surface Transportation Board in 2022. CSX has exclusive freight operating rights over much of the MBTA system that emanates from North Station, including the Fitchburg Line from Boston to Ayer. From Ayer to Fitchburg, Pan Am Southern holds those freight operating rights. The services on this right-of-way are shown in Figure 3.2.

The MBTA dispatches train operations on the Fitchburg Line from Boston to Ayer and performs maintenance of the right-of-way from Boston to Fitchburg. Pan Am Southern dispatches from Ayer to the state line with Vermont and beyond to New York state. Pan Am Southern maintains the right-of-way from Wachusett into Vermont and New York State. This dispatching control and maintenance, which does not strictly follow the ownership boundaries, can affect the reliability and on-time performance of both freight and passenger train service. Dispatching control and maintenance responsibility are shown in Figure 3.3.

Figure 3.2: Passenger and Freight Operations along the Northern Tier Corridor

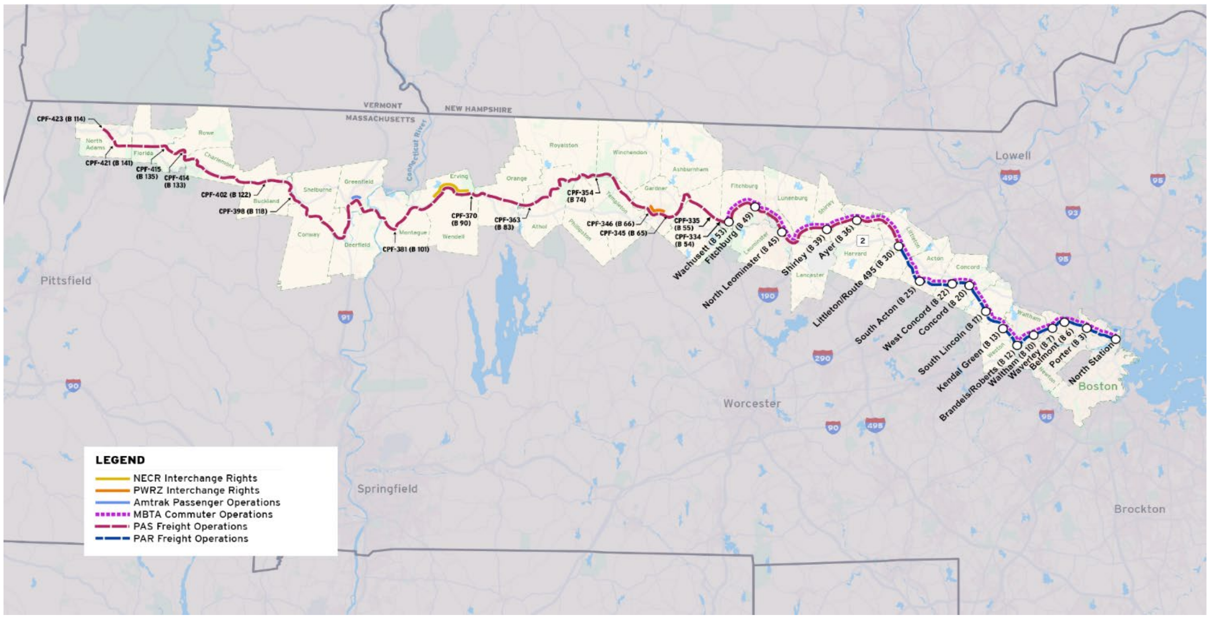
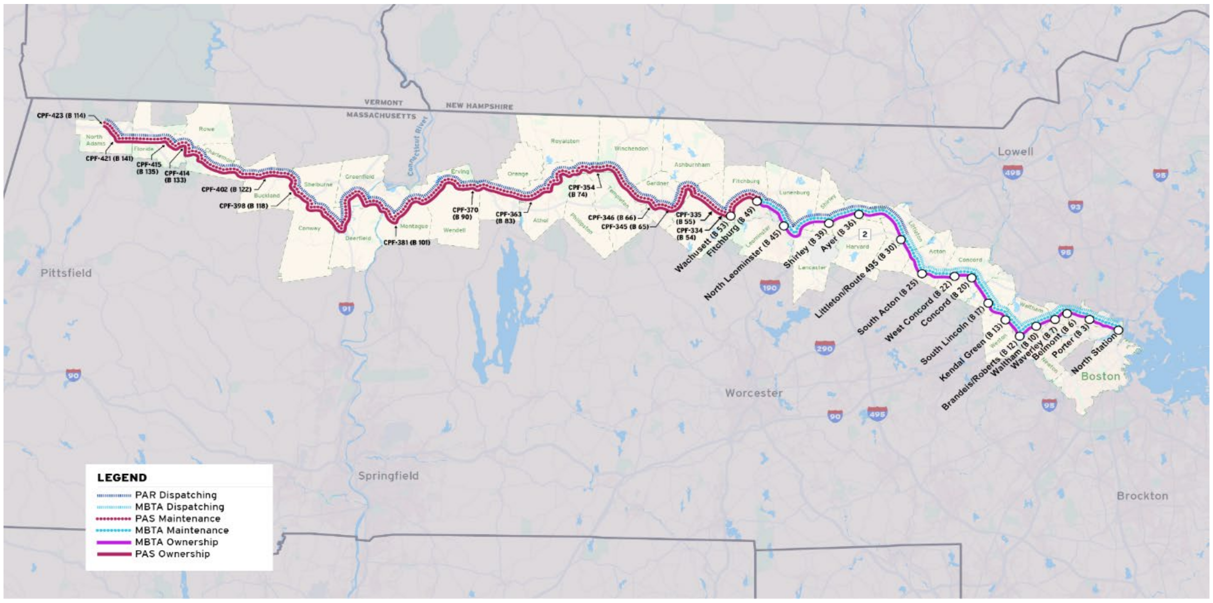


Figure 3.3: Ownership, Dispatching, and Maintenance Responsibilities along the Northern Tier Corridor



Existing Passenger Rail Service

The MBTA operates 34 weekday trains and 16 trains each weekend day on the Fitchburg Line with seven train sets and 17 stations. The weekday span of service is about 4:30 AM to 11:00 PM. Fitchburg Line trains are maintained and stored during the day at the MBTA Commuter Rail Maintenance Facility near North Station. Trains are stored overnight at Westminster Yard, west of Wachusett Station.

Amtrak operates six daily trains to or originating in Greenfield, with regional stops in Northampton, Holyoke, and Springfield. Two of these trains are the round trip of the Vermonter, which operates between St. Albans, VT and Washington, DC. The other trains are the two round trips of the MassDOT-sponsored Valley Flyer service. Valley Flyer trains operate between Greenfield, MA and New Haven, CT where connections are made to New York City and other locations on the Northeast Corridor. The Valley Flyer also offers connections to Bradley International Airport in Windsor Locks, CT from the Windsor Locks Station.

Other Public Transportation

The Northern Tier corridor west of Fitchburg is currently served by regional transit authority service to Charlemont from Wachusett Station – an approximately 4.5-hour trip that requires a transfer from Montachusett Regional Transit Authority service to Franklin Regional Transit Authority service. The schedules do not make a return trip possible on the same day.

West of Charlemont, there is no public transportation service until North Adams, which is served by the Berkshire Regional Transit Authority. Regional intercity bus service along Route 2 has been provided periodically, most recently by MAX service run by TrueNorth Transit Group. The service operated between 2015 and 2018.

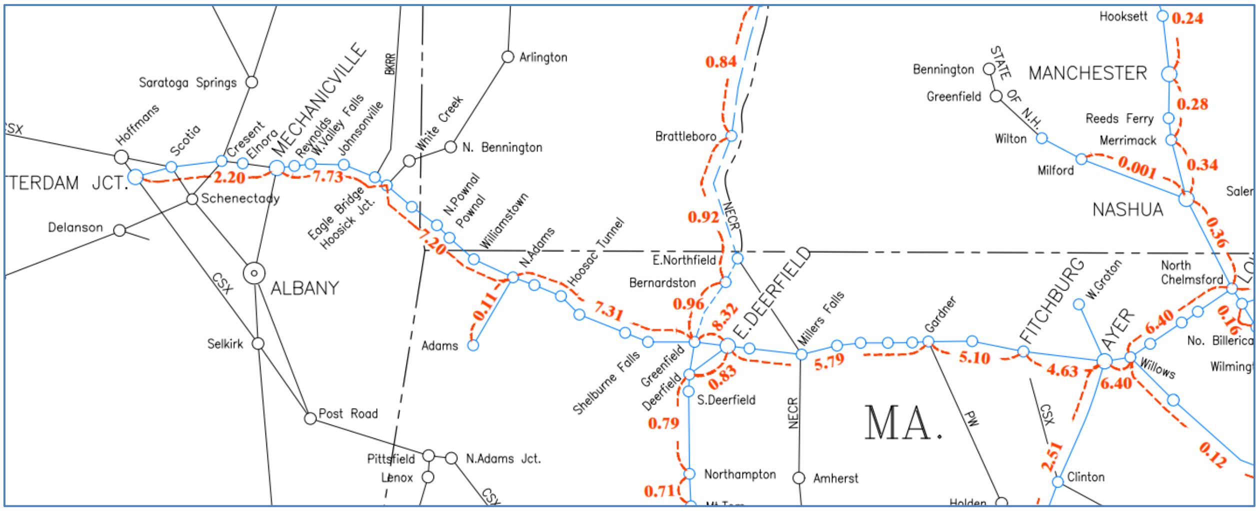
There is no intercity bus service provided in the Connecticut River Valley north of the Five College area or in northern Berkshire County, and there is limited direct intercity bus service to New York City provided from Greenfield and Williamstown. Greyhound provides service from Greenfield to New York City via other destinations in the Connecticut River Valley of Massachusetts and Connecticut. Peter Pan Bus Lines service to Williamstown is concentrated during the weekends on a route that connects other Berkshire County destinations with New York City.

Freight Operations

Freight operations occur primarily between Ayer and North Adams, with approximately ten trains operating daily between Ayer and East Deerfield. In 2019, Pan Am Southern moved more than 37,000 freight carloads under trackage rights arrangements with Norfolk Southern. Aside from traffic hauled on behalf of Norfolk Southern, overhead traffic represents more than one-third of Pan Am Southern traffic while 40-percent of Pan Am Southern traffic consists of deliveries to Pan Am Southern shippers.[3] Figure 3.4 presents annual million gross ton-miles (MGTM) carried over the Pan Am Southern Patriot Corridor. For example, between North Adams and Greenfield, 7.31 MGTM are carried annually (for 2019).

CSX's acquisition of Pan Am Railways produced a CSX commitment to move some Norfolk Southern trains from the Pan Am Southern/Northern Tier right-of-way to the CSX Main Line between Boston and Albany. These and other changes are ongoing.

Figure 3.4: Annual MGTM handled on the Pan Am Southern Patriot Corridor – CSX Application before STB for acquisition of Pan Am Railways



Regulatory Baseline

New passenger rail service along the Northern Tier corridor would be subject to a range of statutes and regulations, including federal requirements, and would require the establishment of a governance structure to provide oversight and funding. Northern Tier service would be classified as an intercity service under federal law. As such, it is subject to safety regulation by the Federal Railroad Administration (FRA) of the United States Department of Transportation (USDOT). Northern Tier infrastructure improvements would most likely be eligible for federal intercity rail funding.

As outlined in the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), intercity trains are trains with routes less than 750 miles long with long distances between stations serving a variety of markets – e.g., tourism, business travel – but not specifically serving daily work trips. Intercity service is distinguished from commuter rail service in that the latter has a service pattern that historically has transported workers from suburban areas to downtown cores, with peak-oriented services and fare policies to serve and encourage high frequency riders. The Federal

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[3] Overhead traffic is freight that the railroad moves over its right-of-way, which neither originates nor is delivered on that railroad.

Railroad Administration generally restricts its capital funding to intercity services, while the Federal Transit Administration generally does not fund intercity capital projects.

The National Railroad Passenger Corporation, better known as Amtrak, provides most U.S. intercity service and possesses a statutory right to operate on any other railroad in the country. Amtrak's experience in intercity passenger operations and its access to operate on other railroads gives it advantages in working with state sponsors of new intercity services. Amtrak's access rights may allow the state sponsor to obtain operations access at a better price than if the state negotiated on its own. However, contracting with Amtrak for operations does not necessarily provide the state sponsor any reduction in infrastructure costs for a new service. Amtrak's intercity services often operate on rights of way owned by privately owned freight railroads. However, there is no comparable statutory right for freight railroads to operate on Amtrak or other railroad rights of way. Freight railroads obtain rights on other railroads through acquisitions, agreements, deeded rights, and other sources.

The Surface Transportation Board (STB) is an independent federal agency that is charged with the economic regulation of various modes of surface transportation, including freight railroads. One example is its recent adjudication of the acquisition of the Pan Am Railways by CSX. In its decision on the CSX-Pan Am Railways acquisition, the STB concluded that CSX should continue to work with passenger rail partners to address any future regional growth. As a result, there will be no near-term change in how passenger rail projects can gain access to the lines of the private railroads – either by agreement, or through Amtrak.

The Springfield Terminal Company (STC) is one of the Pan Am Railways railroads that has been acquired by CSX. STC currently operates all trains on the Pan Am Southern network. Springfield Terminal functions as a contract operator for Pan Am Southern and serves as Pan Am Southern's agent. Norfolk Southern has trackage rights over the Pan Am Southern line between Mechanicville, New York, and Ayer, Massachusetts. These trackage rights generally allow Norfolk Southern to operate its own trains between those points. However, Springfield Terminal currently operates those Norfolk Southern trains. The CSX acquisition of Pan Am Railways included a plan to transfer the STC operations to the Berkshire & Eastern Railroad (B&E). The B&E (also known as Pittsburg and Shawmut Railroad (PSR)) is a subsidiary of the Genesee & Wyoming Railroad (G&W).

Pursuant to section 60 of chapter 176 of the acts of 2022, the Western Massachusetts Passenger Rail Commission (WMPRC) was established to assess passenger rail construction, operations, maintenance, and governance in the Commonwealth outside of the MBTA service area.[4] In November 2023, the WMPRC released its final report which concluded by stating that "the Legislature should look to MassDOT as the best entity to receive and manage additional resources should expansion of intercity rail services continue in future years".[5] Aside from the WMPRC recommendation, there are no unique factors in regulatory status or other governance and financing structures that would then prevent development of an intercity passenger rail service on the Northern Tier.

Route Configuration

The MBTA-owned Fitchburg Line is double tracked except for a 0.4-mile stretch in Waltham. The Pan Am Southern-owned right-of-way west of Fitchburg is principally single-track with sidings. Interlocking spacing averages six miles along the line.[6] Doubletracking with frequent interlockings

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[4] Mass. Gen. Laws ch. 176, § 60 (2022)

[5] https://archive.org/details/wmpr-final-report/page/n31/mode/1up

[6] Interlockings are locations where switches allow trains to be held by the dispatcher or to change tracks.

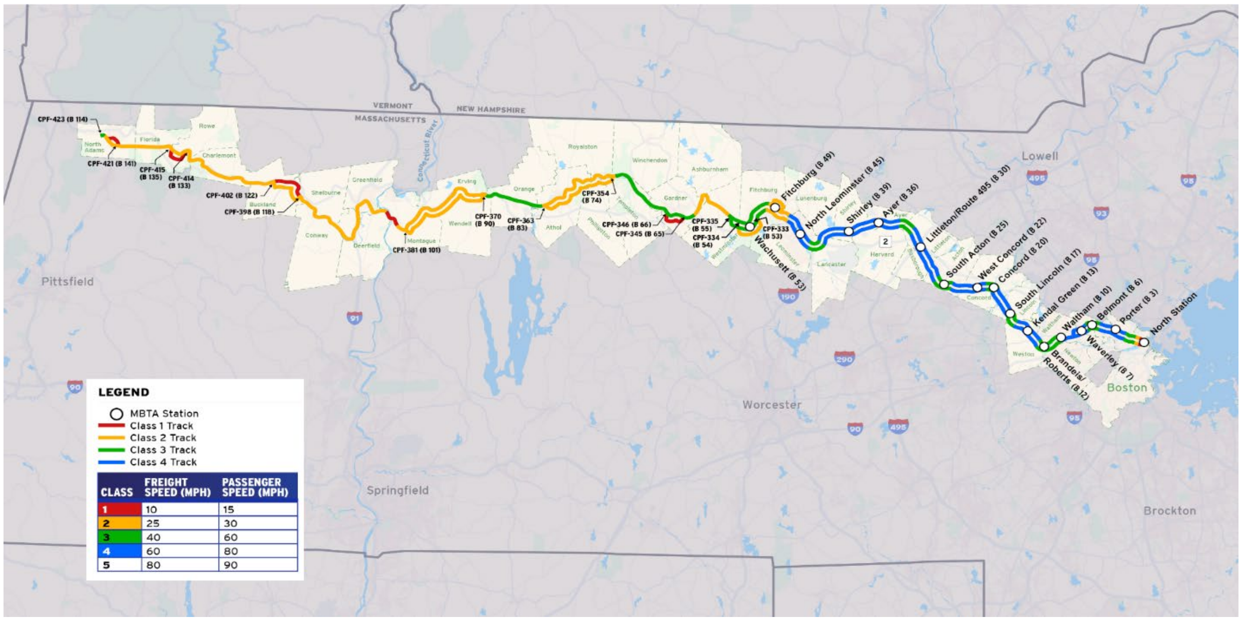
allows greater flexibility in operations, as more trains can be operated on a route segment in the same or opposite direction and can be moved from track to track as conditions require, such as station stops and freight drop-off and pick-up. These factors play a significant role in system capacity and the development of service alternatives. The right-of-way is equipped with Positive Train Control, a federally mandated safety technology.

Freight yards include locations in Ayer, Fitchburg (at the former MBTA layover location), and East Deerfield. Pan Am Southern connects with other freight railroads at Ayer, Greenfield, and other locations.

Allowable Speeds and Shared Corridor Challenges

Federal regulations establish several classes of track with associated Maximum Authorized (or Allowable) Speeds for passenger and freight trains. The classes of track that apply to the Northern Tier are shown in Figure 3.5. The class of track is dictated by the condition of the track and railroad-bed components, the grades, the curvature of the track, and the signaling system. Superelevation, where the outside rail of a curve is elevated, can be added to curves in the track to allow certain trains to operate at higher speeds.

Figure 3.5: Track Classes and Maximum Allowable Operating Speeds



CLASS	FREIGHT SPEED (MPH)	PASSENGER SPEED (MPH)
1	10	15
2	25	30
3	40	60
4	60	80
5	80	90

Differences in allowable speeds for passenger and freight trains on a shared corridor have the potential to impact schedules for both. A related factor is the signal system, which is designed to maintain a distance between trains corresponding to a safe braking distance, with the heavier freight trains often requiring longer braking distances.

Other factors that limit train speeds are grades and curves. Grade is the change in elevation of the railroad as it ascends and descends hills, which are important features of the Northern Tier right-of-way. The dominant grades of the railroad in each segment affect the amount of locomotive power required for a train to safely ascend and descend those grades. These factors together also govern the maximum speed of a train on the grades it encounters on the right-of-way. The most extreme grade on a segment of the right-of-way will establish the maximum length and weight of the train and required locomotive power. These characteristics will affect the speed of the train on the rest of the segment of the right-of-way. The relationship of the train wheels to the rail on a curve involves a variety of forces, including pushing, pulling, and centrifugal forces. These forces in the wheel- rail relationship limit the speed at which the train can move safely through the curve, similar to the forces on an automobile operating through curves.

Additional Corridor Characteristics

Highway-Rail Grade Crossings

There are 69 active grade crossings along the corridor between Somerville and North Adams. Active highway-rail grade crossings along the corridor were inventoried, including the location of the crossing, the unique U.S. Department of Transportation (USDOT) crossing number, and the number of tracks currently in place at the crossing. The inventory is shown in the Appendix.

Grade crossings are classified as either public or private. Public grade crossings involve roadways or pathways that are under the jurisdiction of and maintained by a public authority. Private grade crossings involve privately owned roadways or pathways intended for use by the owner or by the owner's invitees. A private crossing is not intended for public use and is not maintained by a public authority. Private grade crossings are typically established through an agreement between the railroad and the users of the grade crossing.

The inventory also identifies crossings that are pedestrian only. These crossings may be either public or private but are only for passage by pedestrians. Most pedestrian crossings along the corridor are associated with rail stations or rail yards.

Warning devices are installed at most grade crossings to identify the presence of the crossing and the potential for train activity. Active warning devices (e.g., flashing lights and gates) indicate when a train is approaching the crossing. Passive warning devices (e.g., railroad cross-buck signs and stop signs) alert a driver or pedestrian that a grade crossing is present but do not provide a warning that a train is approaching. The configuration of grade crossing warning devices is guided by the Federal Highway Administration’s (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) and must conform with regulations established by the FRA. In Massachusetts, the Massachusetts Department of Public Utilities oversees the design and installation of new grade crossing warning devices.

The FRA requires that trains sound their horns when approaching and traveling over a public grade crossing and has specific requirements governing many of the aspects of train horns. Communities may establish a “quiet zone,” an FRA exemption where trains are not required to regularly sound their horns when approaching a public grade crossing, through a process led by the community, governed by FRA, and coordinated with the operating railroad which may include the installation and maintenance of certain supplemental safety measures to mitigate for the reduced safety conditions resulting from the elimination of train horns. As of October 2022, Massachusetts has 29 quiet zone locations, including one in Ayer.[7]

Additional train operations may require evaluation of noise impacts. New rail services usually implement grade crossing safety programs such as Operation Lifesaver Inc. (OLI).

The Federal Railroad Administration Grade Crossing Inventory is available in the Appendix.

Bridges and Tunnels

Pan Am Southern and the MBTA Fitchburg Line include numerous structures, including undergrade bridges that carry the railroad over roadways and waterways and overhead bridges that carry roadways over the railroad. The Federal Railroad administration requires Pan Am Southern and the MBTA to maintain bridge management plans (BMP) for the inspection and maintenance of these structures. These plans include bridge inventories and condition information. A review of detailed track charts identified 97 bridges on the Pan Am Southern. Future planning and design phases would require access to these plans as well as details on existing and proposed freight and passenger train operations.

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[7] Federal Railroad Administration Quiet Zone Locations by City and State

Pan Am Southern includes the engineering landmark known as the Hoosac Tunnel. The tunnel under the Hoosac Mountain was completed in 1875 at 4.75 miles in length and remains the longest tunnel east of the Rocky Mountains, connecting the municipalities of North Adams and Florida. In 2020, the Tunnel was closed for two months for repairs.[8]

Stations

Historical stations were inventoried and underwent preliminary screening for several factors, including location access and area characteristics, surrounding platform fit, nearby transit services, and potential parking. Locations in Baldwinville, Gardner, Athol, Orange, Erving, Millers Falls, Greenfield, Shelburne Falls, Charlemont, Zoar, North Adams, and Williamstown were reviewed.

While many of the historical station locations have the potential for parking and full length, accessible platforms, there are challenges in terms of highway access and track configuration (e.g., the proposed transfer between Valley Flyer and Northern Tier trains at Greenfield).

Profiles for potential stations provide a summary analysis of the historic station locations and an overview of their feasibility as new passenger rail stations. The following station assumptions are included as part of the analysis:

- Platform length of no longer than 800 feet
- Platform to be 12 feet wide at four feet above top of rail
- Platforms to be located on straight track, where feasible
- All platforms to be accessible, including platform height to allow level boarding, and an accessible path of travel to the nearest public way or parking area
- Space for parking should be available at the station or nearby, and a pick-up and drop-off area provided
    - The number of parking spaces required for each station has not been determined at this level of planning

Existing regional transit bus routes within 0.5 miles of the potential station locations are noted. Any plans for reintroduction of service to these stations would have an impact on the local municipality and the neighborhood surrounding the potential station locations.

North Adams

Station Location Access and Area Characteristics

Located between American Legion Drive and the rail corridor, the site of the historic station is currently occupied by the American Legion and its adjacent parking lot. The site is about 0.5 miles from the downtown area and the Massachusetts Museum of Contemporary Art (MASS MoCA).

The site of the former station roughly parallels the Hoosic River. South of the American Legion is The Brien Center, focusing on mental health and addiction recovery. To the north is the Hotel

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[8] https://www.berkshireeagle.com/archives/hoosac-tunnel-open-again-after-partial-collapse-in-february/article_25edfdfb-2f40-5580-a5d4-5cd192dcfd30.html

Downstreet at the corner of Main Street. Adjacent to Hotel Downstreet is North Adams City Hall. Across American Legion Drive is a shopping center with the North Adams Police and Fire Departments just to the north.

On the southwest side of the rail corridor, the Hoosic River runs parallel with a narrow strip of land in between containing the former 1492 Nightclub and industrial uses to the south. This parcel and the American Legion parcel have been proposed as the location of a model train and building museum. On the west side of the river is the Noel Field Athletic Complex containing the skateboard park, splash park and ball fields. There is currently no connection across the rail corridor.

A new station could be located south of American Legion Highway at the junction of the Adams Branch track and the main line and could be accessed from Ashland Street.

Platform Fit

There is space for a 510-foot platform south of the junction of the Adams Branch track and the main line tracks. A platform at this location could also accommodate any service on the Adams Branch.

Nearby Transit Services

The Berkshire Regional Transit Authority (BRTA) operates the North Adams Loop (34 Line) on weekdays with stops at Main Street, the Massachusetts College of Liberal Arts, Ocean State Job Lot, and Walmart. Additional bus service is provided to Pittsfield via Route 1 and to Williamstown via Route 3.

There is no intercity bus service to North Adams. Peter Pan Bus Lines ended service to North Adams in October 2018.

The Berkshire Scenic Railway Museum provides seasonal, special occasion train service between Adams and North Adams along the Adams Branch. Trains leave Adams from Adams Station off Hoosac Street.

Potential Parking

There is space for parking between the main line tracks and the Adams Branch tracks, which can be accessed from Ashland Street.

Figure 3.6: North Adams, MA yard – Google Earth

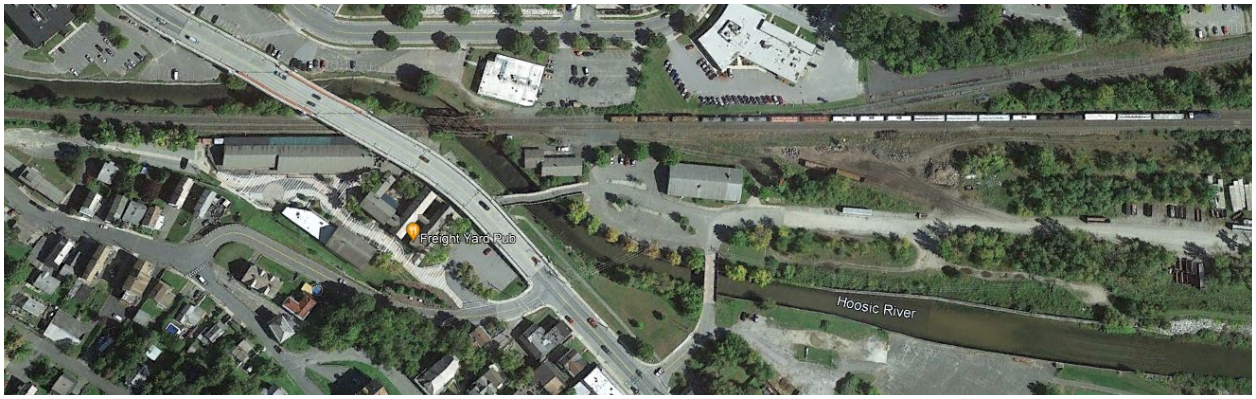


Figure 3.7: North Adams - Area surrounding the location of the former North Adams Station with rail corridors shown in purple – Google Earth

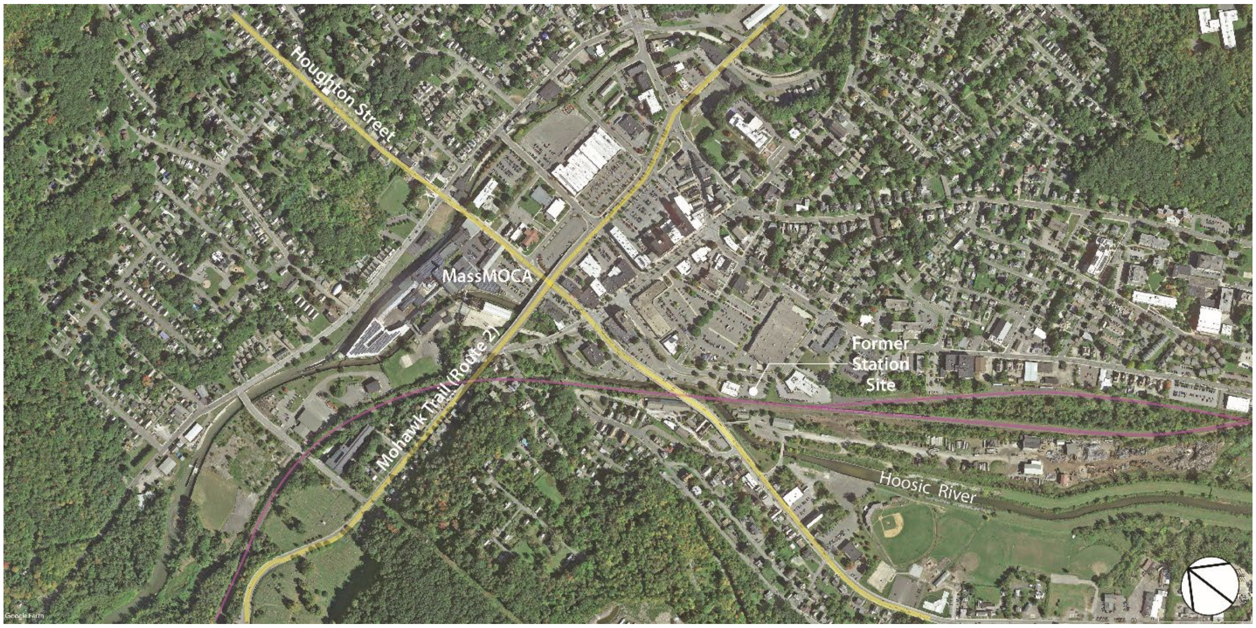
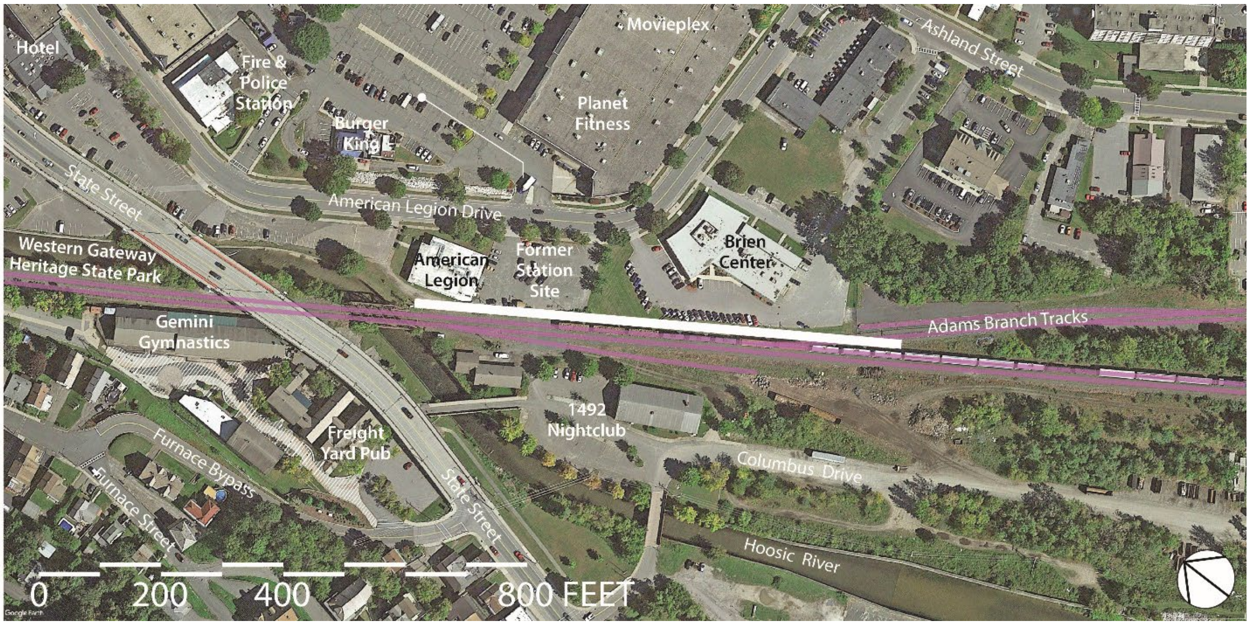


Figure 3.8: North Adams - Site of former station with hypothetical 800-foot platform shown in white for scale – Google Earth



Shelburne Falls

Station Location Access and Area Characteristics

Shelburne Falls is a historic village in the towns of Shelburne and Buckland. The village is split by the Deerfield River, which is crossed by two roadway bridges and a former trolley bridge that has been converted into the Bridge of Flowers — one of the major attractions of the village. Shelburne Falls is accessed via Routes 2/112 from the west and Route 2 from the east.

The former station is located on the south side of the river in a rail yard that has been converted into the Shelburne Falls Trolley Museum.

Platform Fit

Two tracks run through the corridor along a straight section that is adequate for a 510-foot platform on either side of the tracks.

Nearby Transit Services

There is currently no RTA or intercity bus service to Shelburne Falls.

Potential Parking

There are several locations that have potential for a parking area off Depot Street. Additionally, shared parking could be considered at the Trolley Museum or at the Blue Rock Restaurant.

Figure 3.9: Shelburne Falls - Area surrounding former station with rail corridor shown in purple – Google Earth

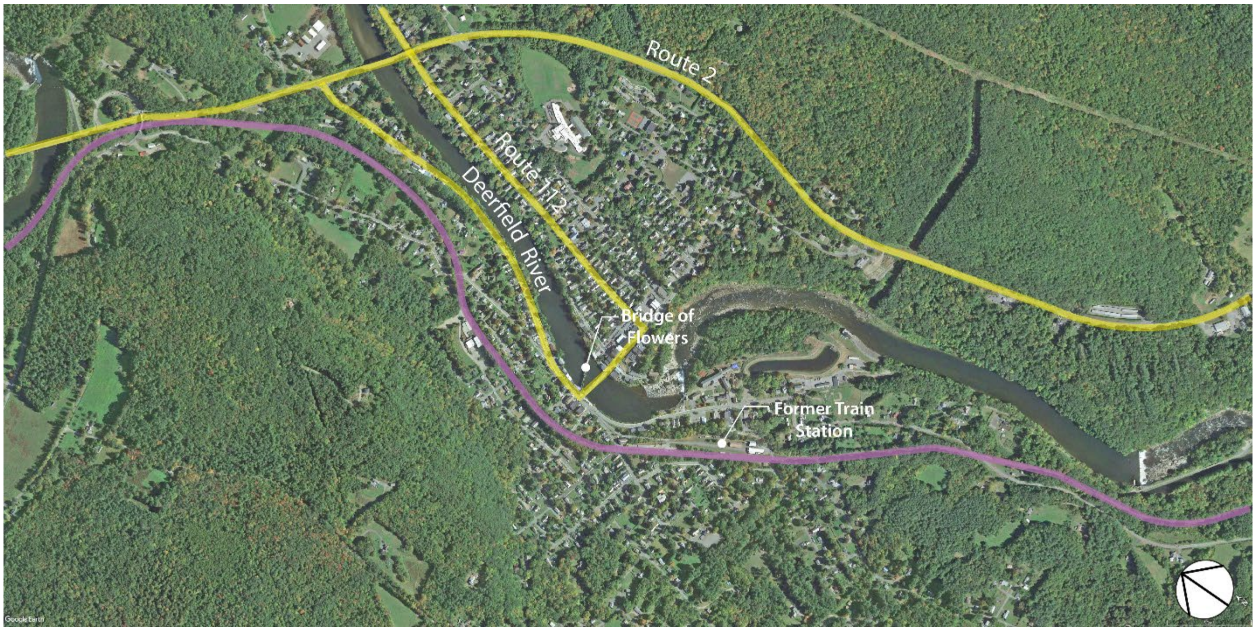
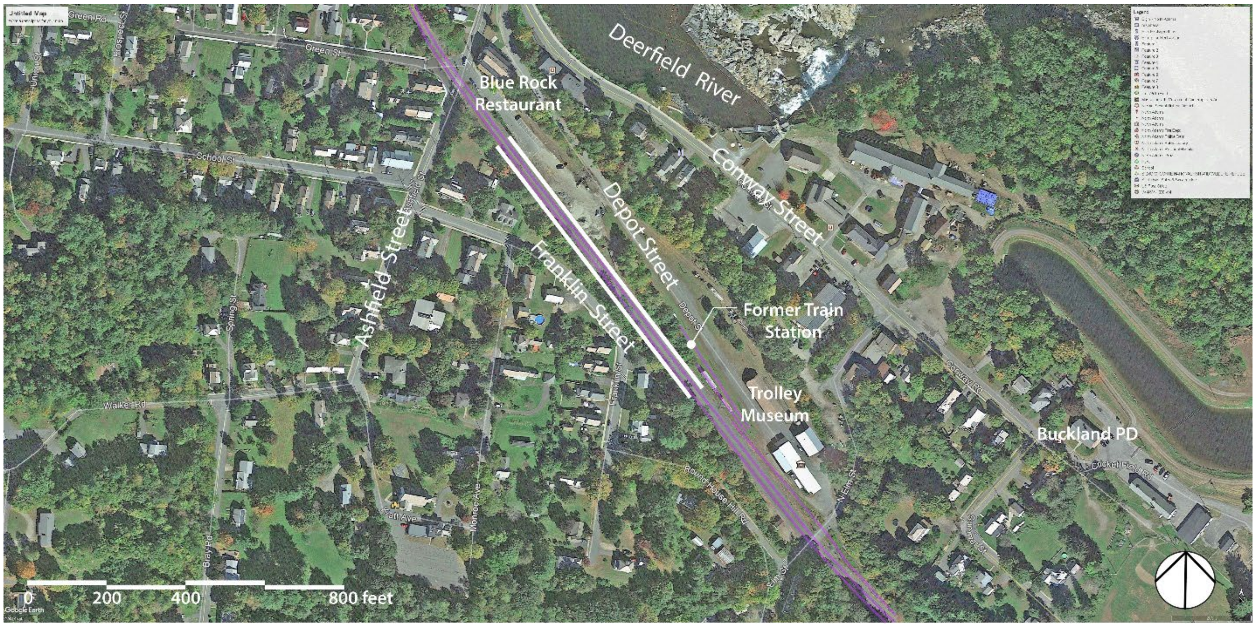


Figure 3.10: Shelburne Falls - Former station location with hypothetical 800-foot platform shown in white for scale – Google Earth



Greenfield

Station Location Access and Area Characteristics

Greenfield is located at the junction of Interstate 91, Route 2, Route 2A, Route 5, and Route 10. Interstate 91 travels north and south through the western stretch of the city and is concurrent with Route 2 for a three-mile stretch.

The former Greenfield train station (demolished in 1966) was located across the tracks from the current train platform, in the present-day Energy Park. The John W. Olver Transit Center is in the vicinity of the former station site and is a stop on the Amtrak Vermonter and Valley Flyer intercity passenger rail service. The passenger rail platform is located along the Connecticut River Line slightly north of where it diverges from the shared right-of-way with the Pan Am Southern freight mainline.

The Olver Transit Center is also home to the administrative offices for both the Franklin Regional Transit Authority (FRTA) and the Franklin Regional Council of Government.

Platform Fit

The tangent section of track opposite the Olver Transit Center, along Deerfield Street, may have adequate space for a 510-foot-long platform.

Nearby Transit Services

Intercity bus connections to New York City and Boston are offered by Greyhound bus lines. The Olver Transportation Center is also the hub of the FRTA, whose local service extends from Bernardston to Northampton and from Orange to Charlemont.

Passenger rail service resumed in Greenfield on December 29, 2014, with the rerouting of Amtrak's Vermonter, with all trains serving the Olver Transit Center. In June 2018, MassDOT announced that Greenfield would become the terminus for an extension of the New Haven–Springfield Shuttle, as a pilot program launched by CTDOT and MassDOT. The new intercity rail service, the Valley Flyer, made its first run on August 30, 2019. It runs twice in each direction on weekdays and once on weekends, to and from Connecticut, with connections to New York City.

Potential Parking

There is a parking lot (approximately 35 spaces) associated with the Greenfield ITC, the Olive Street Parking Garage just to the north, and a public parking lot on Hope Street. Parking access could be provided from Deerfield Street, but the steep topography could make access challenging.

Figure 3.11: Greenfield, MA passenger train station and intermodal

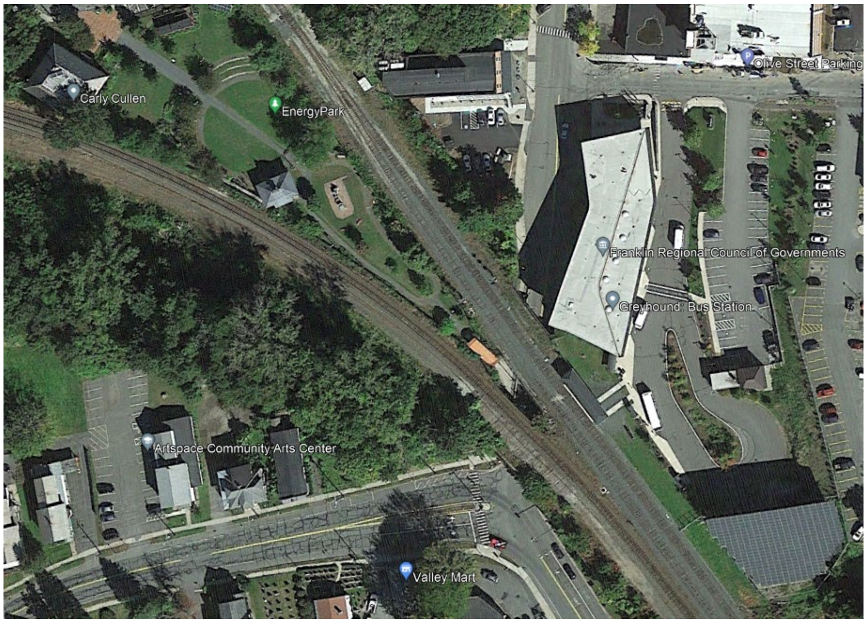


Figure 3.12: Area surrounding Greenfield ITC with rail corridors shown in purple – Google Earth

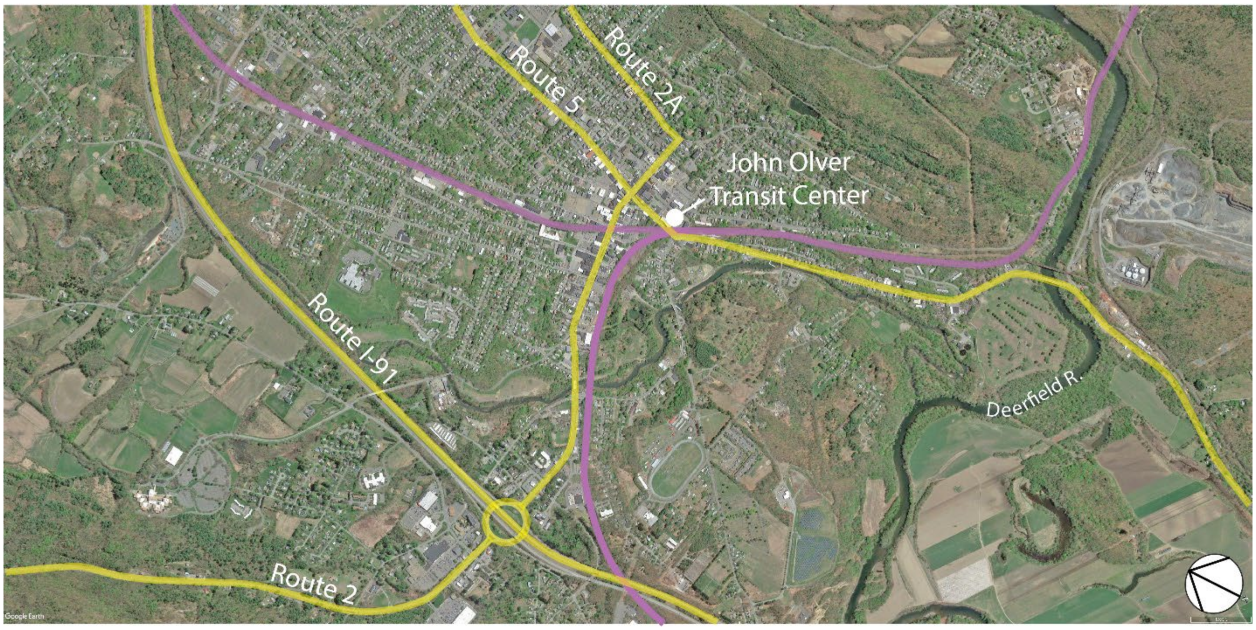
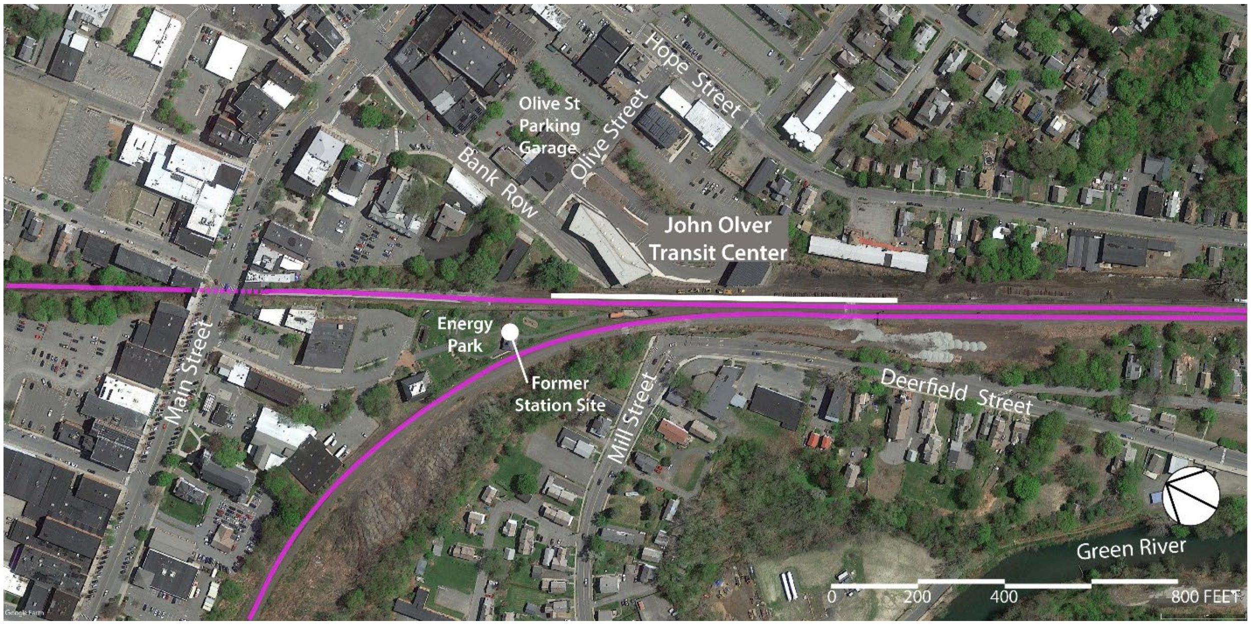


Figure 3.13: Site of Greenfield ITC with hypothetical 800-foot platform shown in white for scale – Google Earth



Athol

Station Location Access and Area Characteristics

Athol lies along Route 2, which is concurrent with U.S. Route 202 as a limited access highway through town, with its old route, now Route 2A, passing through downtown Athol. Route 2A (Main Street) is the principle east-west roadway access through Athol. Route 2 (also Route 202), the closest highway, is approximately two miles south of the downtown and connects with Daniel Shays Highway to the southwest and with Petersham Road (Route 32) to the southeast.

The former train station is owned by the MART and serves as the Athol Depot ITC for regional bus service through Athol and Orange.

Platform Fit

The rail corridor runs along the area of the historic station and there may be sufficient length along the track between the bridges at Carbon Street and School Street for a 510-foot-long platform.

Nearby Transit Services

The Montachusett Regional Transit Authority (MART) ITC is one block south of Main Street on South Street. The Gardner-Athol Link provides transit services for Athol and the neighboring communities of Phillipston and Templeton to Gardner. Five stops are located along Main Street in Athol. The Athol/Orange Shuttle service provides 12 trips per day each way between the two communities.

The Hannaford Shopping Plaza at the western end of Athol is served by both MART and FRTA and serves as the point of connection between both systems. The FRTA, based in Greenfield, has daily runs from the Plaza to points west while MART, based in Fitchburg, runs to points east. Community transit service buses provide dial-a-ride service for Athol and the nearby towns of Orange and Winchendon for trips to work, medical appointments, shopping, or other errands. There is no intercity bus service to or from Athol.

Potential Parking

There is an approximately 38-space, town-owned parking lot at the corner of Traverse Street and School Street. Additionally, there is a two-level parking facility across Traverse Street from the MART ITC. The upper level is accessed from Traverse Street and could serve as parking.

Figure 3.14: Athol - Area surrounding former station with rail corridor shown in purple– Google Earth

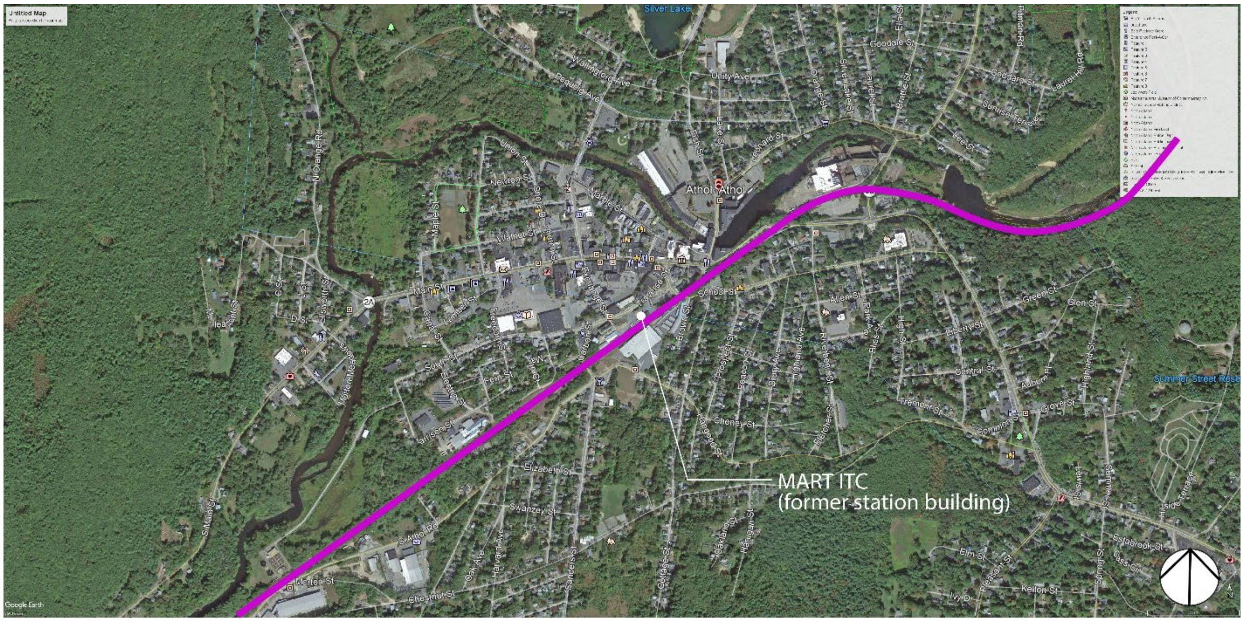
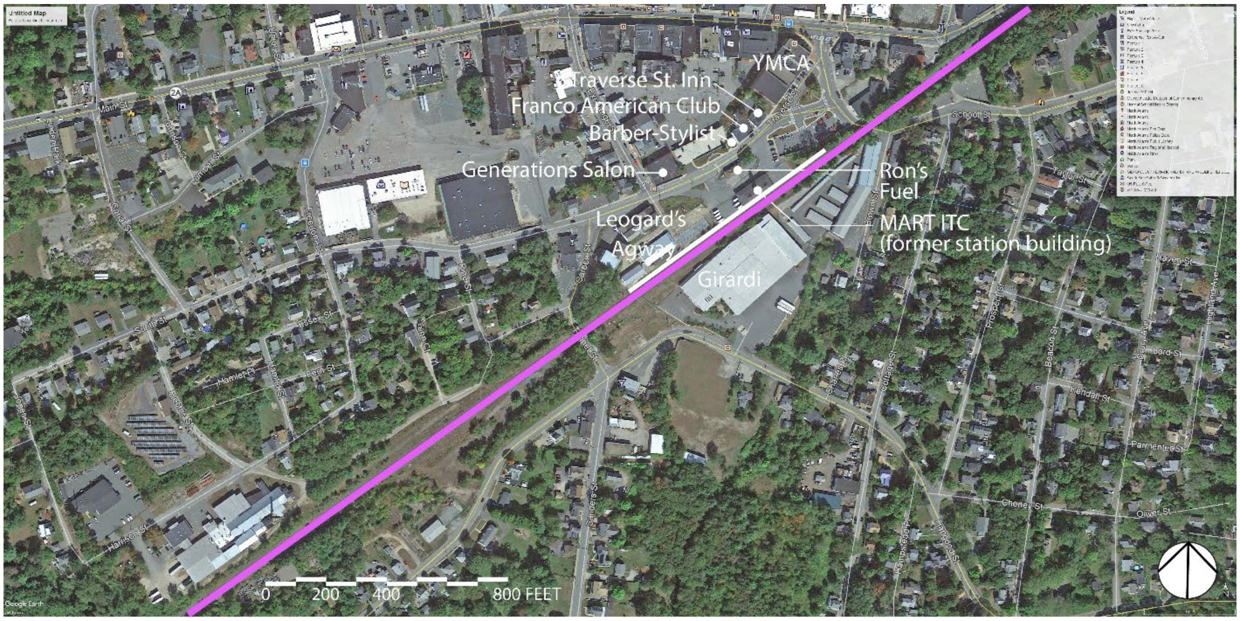


Figure 3.15: Athol Center with hypothetical 800-foot platform shown in white for scale – Google Earth



Gardner

Station Location Access and Area Characteristics

The rail corridor is closely paralleled by Route 2, which passes just south of Gardner's downtown. The downtown can be accessed from Route 2 by two exits on either side of the downtown that are roughly 0.75 miles apart. Approaching Gardner from the west, Exit 86 connects to Route 68, also called Timpany Boulevard and Main Street. From the east, Exit 87 connects to Pearson Boulevard, which links to Main Street via Chestnut Street.

Union Square, the street side of the tracks along Pearson Boulevard, is lined with commercial establishments and restaurants. Properties along the corridor are part of the Downtown Urban Renewal District.

The parking lot on the west side of the former Jade II restaurant is the location of the original Union Station.

Platform Fit

The track running between Pearson Boulevard-Chestnut Street and Route 2 provides an opportunity for a 510-foot platform. To the east, the tracks pass over Pearson Boulevard, and to the west, sidings turn off the main line toward the north. One of these sidings passes just south of the MART maintenance facility.

Nearby Transit Services

Gardner is served by MART operating local fixed-route bus services and shuttle services, as well as paratransit services. Both the MART Gardner Route 1 and Route 2 bus service currently stop at Gardner Plaza and the MART Intermodal Transportation Center. The parcel which contains the MART Intermodal Facility, is owned by MART and abuts the rail corridor. MART also runs the Wachusett Shuttle service from Gardner City Hall and the MART Maintenance Facility to the MBTA Wachusett Station and Fitchburg Intermodal Transportation Center, with commuter rail connections to Boston.

Potential Parking

There is no public parking immediately adjacent to the rail corridor, although there is a small lot between the former D’Angelo’s Restaurant and the Tender Heart Animal Hospital which may have potential for parking.

Figure 3.16: Gardner, MA freight railroad yard – Google Earth

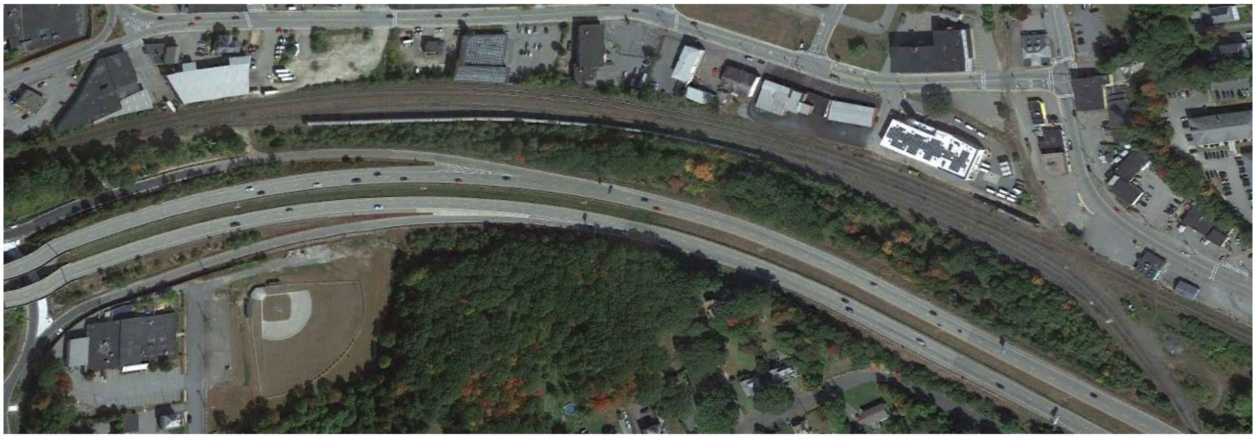


Figure 3.17: Gardner Center area with rail corridor highlighted in purple, parallel to Route 2. The Montachusett Regional Transit Authority (MART) facility is adjacent to the former station location - Google Earth

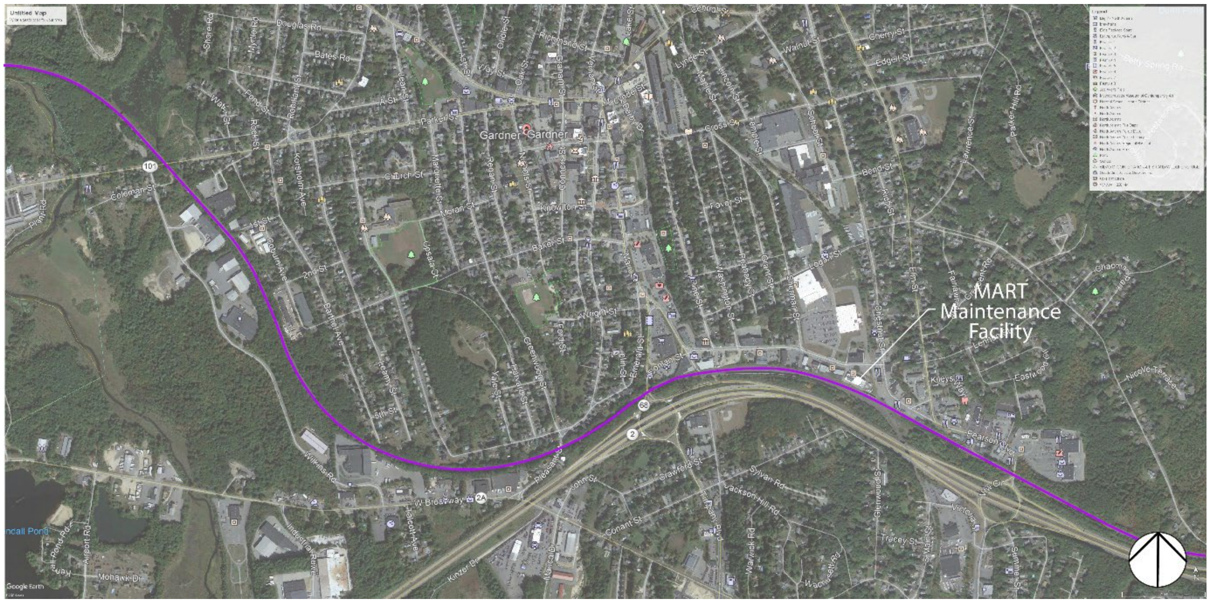
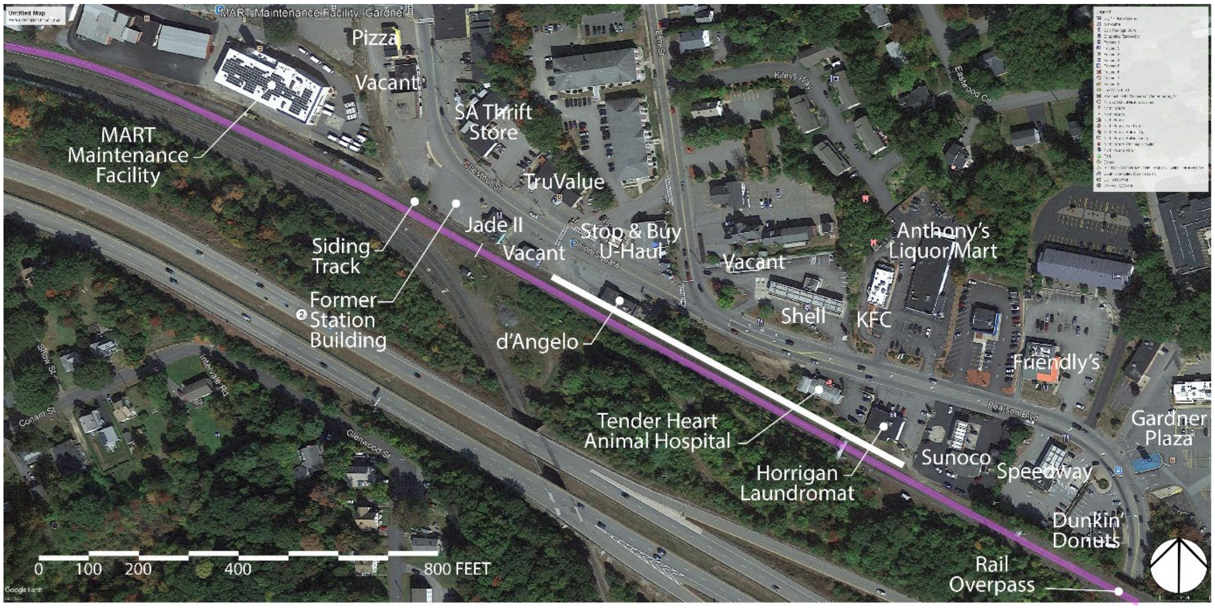


Figure 3.18: Gardner Station area with hypothetical 800-foot platform is shown in white for scale - Google Earth



Environmental Review

Existing environmental constraints within and adjacent to the Northern Tier route were identified using mapping tools such as the MassGIS MassMapper and the U.S. Environmental Protection Agency (U.S. EPA) Environmental Justice (EJ) Screen.

The corridor traverses several natural, built, and social resources including wetlands and waterways; FEMA designated floodplains; designated open space and recreational parklands;

National Register listed historic districts and properties; state designated Areas of Critical Environmental Concern (ACEC); and 2020 EJ Census block groups. Detailed mapping of these resource areas and demographic groups is provided in the Appendix**.** A description of each figure is provided in Table 3.1 below, with the corresponding regulatory review and permitting requirement**.** Potential regulatory review and permitting requirements are based on anticipated funding sources, scope of work and proximity of sensitive environmental resources and demographic groups to the Northern Tier route. The complexity and duration of the agency review and approval process will be determined by the extent of unavoidable impacts associated with the proposed action.

Table 3.1: Potential Regulatory Review and Permitting Requirements for the Northern Tier Corridor

Regulation	Trigger	Jurisdictional Agency	Project Considerations	Mapping
Federal				
National Environmental Policy Act (NEPA)	Any federal agency action (including federal permitting or financial assistance).	Lead federal agency	The lead federal agency is responsible for determining the appropriate NEPA Class of Action (Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement) based on the significance of environmental impacts.	N/A
Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800)	Any federal agency action with the potential to affect historic properties that are listed or are eligible for listing in the National Register of Historic Places.	State Historic Preservation Officer (SHPO)	The Advisory Council on Historic Preservation (ACHP) exempts certain undertakings from standard Section 106 review for any project that occurs entirely within the existing railroad ROW.	Appendix A Figure 6 depicts historic properties and districts available through MACRIS adjacent to the Northern Tier Corridor. Areas with a high concentration of historic properties occur near Williamstown and North Adams (Sheet A), Charlemont, Shelburne, and Greenfield (Sheet B), Montague and Orange (Sheet C), Athol and Fitchburg (Sheet D), Shirley (Sheet E), Weston and Waltham (Sheet F), and Belmont, Somerville, Cambridge and Boston (Sheet G).

Section 4(f) of the Department of Transportation Act of 1966 (23 CFR 774)	Any temporary occupancy or “use” [1] of significant publicly owned park, recreational area, wildlife, or waterfowl refuge or any publicly or privately-owned historic sites that are listed or eligible for listing on the National Register of Historic Places.	Lead federal agency and officials with jurisdiction over the subject parcel(s)	The lead federal agency and officials with jurisdiction cannot approve the “use” of land from any jurisdictional property unless there is no feasible avoidance alternative to the use of land, and the action includes all possible planning to minimize harm to the property resulting from such use.	The location of publicly owned and accessible recreational parcels that may be subject to 4(f) jurisdiction are identified in Appendix A Figure 5. Historic properties (available through MACRIS) adjacent to the Northern Tier Route are depicted in Appendix A Figure 6.
Section 7 of the U.S. Endangered Species Act	Any federal agency action with the potential to affect federally protected threatened and endangered species (as defined by 50 CFR § 17.3).	U.S. Fish and Wildlife Service and National Marine Fisheries Service (NMFS)	The level of consultation required with USFWS and/or the NMFS will be determined based on the potential for the project to cause adverse effects to any federally listed species.	The presence of federally protected species and their habitats will be identified through a survey of the proposed Northern Tier Route using the USFWS IPAC tool.

Section 404 of the Clean Water Act (33 USC 1344)	Required for any discharge of dredged or fill materials to Waters of the United States[2]	U.S. Army Corps of Engineers	The need for Section 404 authorization will be determined once the preferred alternative has been established. All impacts to waters of the U.S.should be avoided and/or minimized to the maximum extent practicable.	Wetland resource areas adjacent to the Northern Tier Route are depicted in Appendix A Figure 2.
Section 9 of the U.S. Rivers and Harbors Act of 1899	Required for any proposed construction or modification of a bridge or causeway over a navigable water of the U.S. (as defined by 33 CFR 32.9)	U.S. Coast Guard (USCG)	The presence of “navigable waterways” intercepting the Northern Tier Route requiring authorization from the USCG will be determined through review of their consistency with the navigability criteria.	Waterways intercepting the Northern Tier Route are depicted in Appendix A Figure 4.
State				
Massachusetts Environmental Policy Act (MEPA) (301 CMR 11.00)	Any state agency action (including state permitting, financial assistance or land disposition) that triggers a MEPA review threshold	Massachusetts Environmental Policy Act Office	Effective January 1, 2022, any project within a Designated Geographic Area (as defined by 301 CMR 11.02) that triggers any of the MEPA review thresholds (301 CMR 11.03) is required to file an EIR with the MEPA Office.	Environmental justice populations[3] adjacent to the Northern Tier route are depicted in Appendix A Figure 1.

	pursuant to 301 CMR 11.03.		The Northern Tier Route traverses state designated ACECs. Any work within an ACEC that does not meet the exemption criteria (301 CMR 11.03(2)b.3.) will trigger the MEPA review threshold at 301 CMR 11.03(11)b.	State designated ACECs adjacent to the corridor are depicted in Appendix A Figure 4. The Northern Tier Route passes through the Squannassit and Petapawags ACECs in Shirley, and Groton, respectively (Sheet E).
Massachusetts Wetlands Protection Act (WPA) (310 CMR 10.00)	Impacts to wetland resource areas specified under 310 CMR 10.02.	Municipal Conservation Commissions	The need for WPA authorization will be determined once the preferred alternative has been established. All impacts to jurisdictional wetland resource areas should be avoided and/or minimized to the maximum extent practicable.	Wetland resource areas adjacent to the Northern Tier Route are depicted in Appendix A Figure 2.
				Federal Emergency Management Agency (FEMA) delineated floodplains are depicted in Appendix A Figure 3. The Northern Tier Route does not pass through any mapped floodplain between North Adams and Leominster (Sheets A through E).
M.G.L. Chapter 91 – The Massachusetts Public Waterfront Act (310 CMR 9.00)	Work activity within, under or over flowed tidelands, filled tidelands, great ponds and certain non-tidal rivers and streams within the Commonwealth.	Massachusetts Department of Environmental Protection (MassDEP)	The applicable MassDEP authorization (minor modification concurrence, waterways license or waterways permit) will be determined by the proposed nature of work within Chapter 91 jurisdictional areas.	The jurisdictional limits of historically filled tidelands near the Northern Tier Route are depicted in Appendix A Figure 4, Sheet G.
Section 401 Water Quality Certification Program (314 CMR 9.00)	Required for any proposed discharges of dredged or fill material to Waters of the U.S. within the Commonwealth as defined in	MassDEP	The need for Section 401 Water Quality Certification will be determined based on the extent and location of unavoidable impacts to jurisdictional wetland resource areas.	Wetland resource areas adjacent to the Northern Tier Corridor are depicted in Appendix A Figure 2. Outstanding resource waters adjacent to the Route are depicted in Appendix A Figure 4.

	314 CMR 9.02.			
Massachusetts Endangered Species Act (321 CMR 10.00)	Required for any state agency action that may have the potential to affect protected rare species and their habitats as defined by 321 CMR 10.02.	Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)	The level of consultation with NHESP or need for a Conservation Management Permit (CMP) will be determined based on the nature of proposed work within NHESP Priority and estimated habitat (as defined in 321 CMR 10.02) and potential for a “take” [4] of a state-listed species.	Mapped NHESP estimated and priority habitats adjacent to the Northern Tier Route are depicted in Appendix A Figure 4.
Article 97 of the Amendments to the Constitution of the Commonwealth	Any transfer or conveyance of ownership or other interests, any change in legal control, or change in use to Article 97 land[5] or interests in Article 97 land.	Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA)	EOEEA and its agencies shall not support an Article 97 Land Disposition unless all other options to avoid the disposition have been explored and no feasible and substantially equivalent alternatives exist. An Article 97 Land Disposition requires the support of a two-thirds vote of the state legislature.	The location of Article 97 protected parcels, as identified by the MassGIS “open space” data layer, are depicted in Appendix A Figure 5.

Regional Demographics and Trends

This section provides an overview of regional trends impacting travel demand, such as population dynamics, economic development activity, and transportation levels of service across modes.

Population

According to the 2020 U.S. Census, the Northern Tier corridor communities are home to 1,751,000 people, which represents approximately 25% of the total population in Massachusetts. The East segment communities are home to 1,408,000 people, 80% of the corridor population. The Central and West segment communities have total populations of 237,000 and 106,000, respectively. The East segment has experienced high population growth in recent years, while the Central and West segments have experienced lower growth or decline, as shown in Figure 3.19. Figure 3.19 shows that the West segment is projected to experience population decline and the Central segment is estimated to see modest growth (1 percent) through 2040.

The East segment saw nine percent growth in population between 2010 and 2020, as compared to five percent growth in the Central segment and a decline of two percent in the West. This disparity in growth rates further exacerbated the differences in population size, with the East segment making up roughly 80% of the population of the corridor, the Central segment 14%, and the West segment six percent.

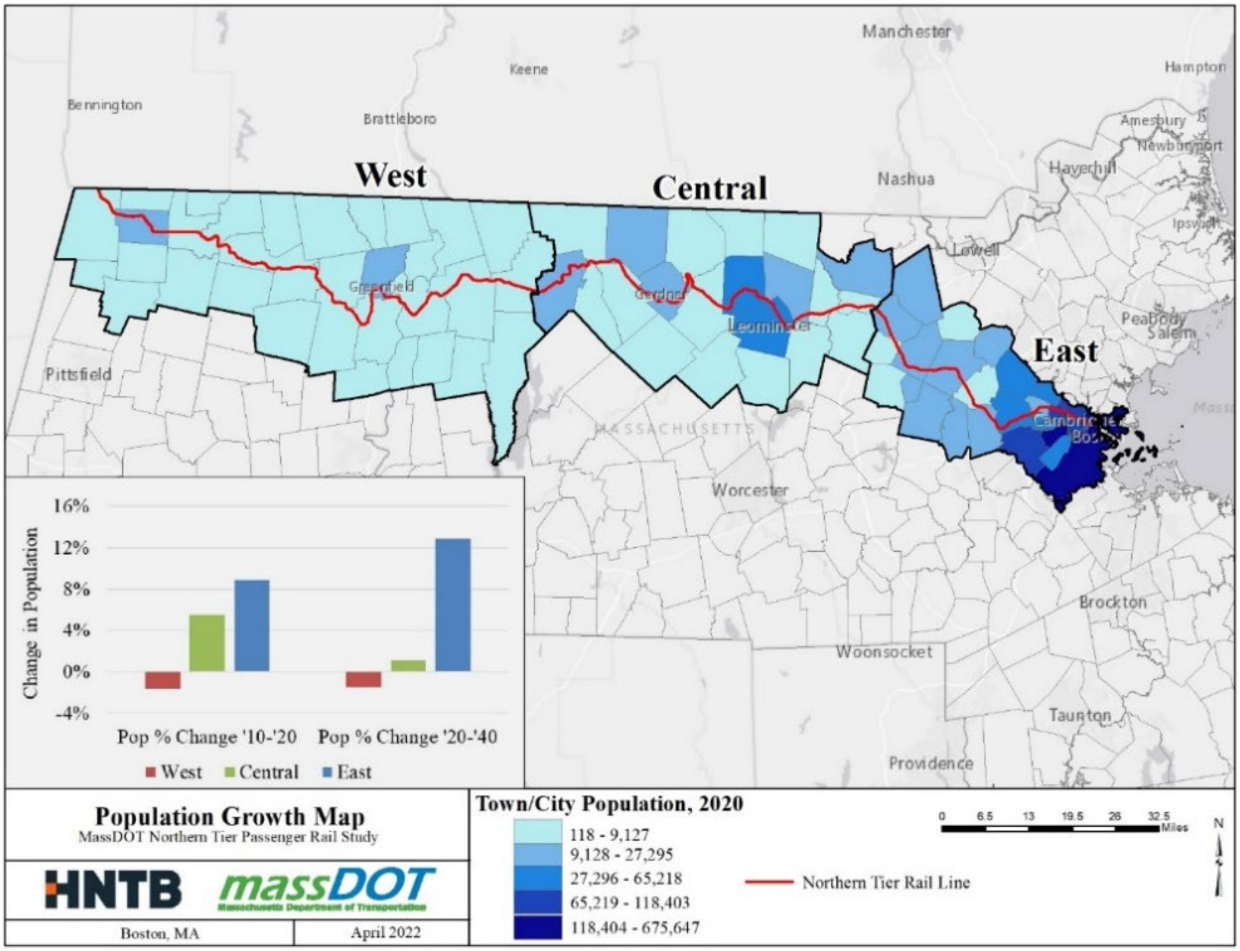
The variations in population growth are reflective of complementary trends, where total jobs and real estate values in the East segment are large and growing while these indicators are steady or in decline further west. If these trends continue, more households may be pushed further out into the west by increasing housing costs, but anchored to the Boston region through the employment and services it offers.

Based on current trends, eastern Massachusetts is poised to continue driving overall statewide growth while the rest of the state lags. Figure 3.19 shows how population density is higher closer to Boston, with lower population density in the Central and West segments. Figure 2 also shows that the West segment is projected to experience population decline and modest growth is projected in the Central segment (one percent) through 2040.

This regional disparity in growth is largely driven by the aging populations outside of the I-495 area. Eastern Massachusetts, with its institutions of higher education, large employment base, and numerous amenities has a much higher proportion of working-age residents (34%) compared to the West (22%) and Central (25%) portions of the corridor. Conversely, the West and Central segments both have higher proportions of older workers, approximately 30% of their populations in the 45 – 64-year age group compared to 23% in the East segment.

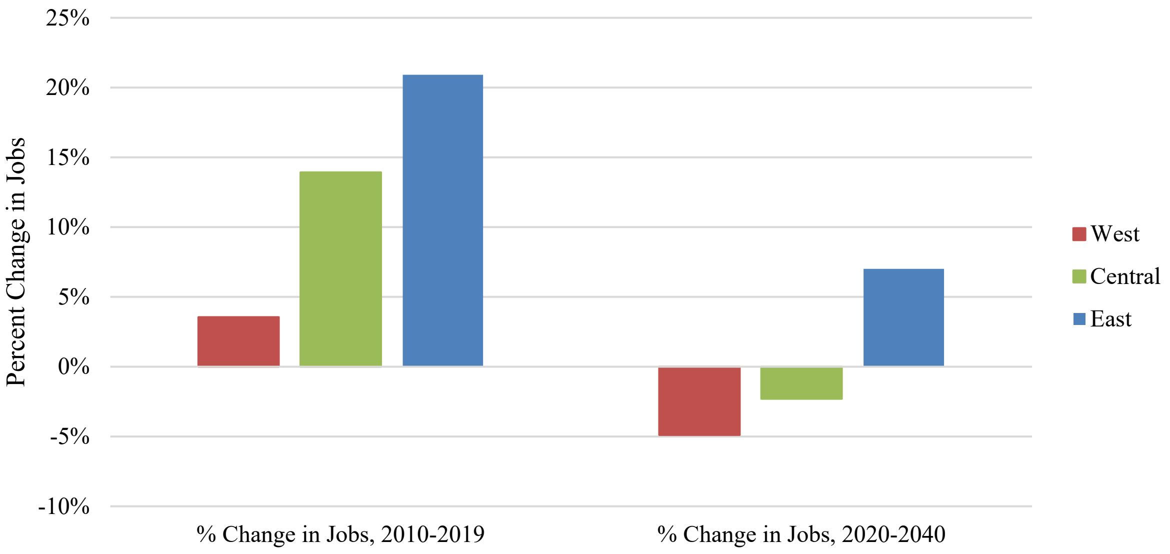
This regional dynamic – with more working-age and young people in the East segment and more older workers and seniors in the Central and West segments – is a primary factor driving overall population and employment trends in the respective regions. The aging population leaving the workforce in the Central and West segments is projected to contribute to a two percent decline in overall jobs in the Central segment and a five percent decline in the West segment, while jobs are projected to increase by seven percent in the East segment (Figure 3.20).

Figure 3.19: Population Growth Map within the Northern Tier Corridor



Source: American Community Survey and UMass Donahue Institute Projections

Figure 3.20: Projected Change in Jobs by Segment



Source: UMass Donahue Institute Projections

However, there is some evidence that the high cost of housing may have begun to dampen growth in large cities shortly before the pandemic, slowing the population boom after the 2008 – 2009 recession. The Brookings Institution noted that in 2018, New York, Los Angeles, and Chicago all lost population, while at the same time rural areas grew – albeit modestly – after several years of losses.[9] This could be driven by the cost of living in these major urban areas, which can act as a drag on the relatively higher wages offered there. Indeed, the cost of living in Suffolk County is 27% higher than Berkshire County, 26% higher than Franklin County, and 22% higher than Worcester County. Though it should be noted that the 2010 – 2020 population change in large cities was robust despite the more recent slowing.

Without major intervention or a disruption in current trends, pressure will continue to rise on the Boston region to provide housing for these projected new jobs. Suburban communities, such as Framingham, Plymouth, Chelsea, Lowell, and Burlington, will continue housing growing numbers of Boston-based workers commuting into the city – in addition to Boston itself.

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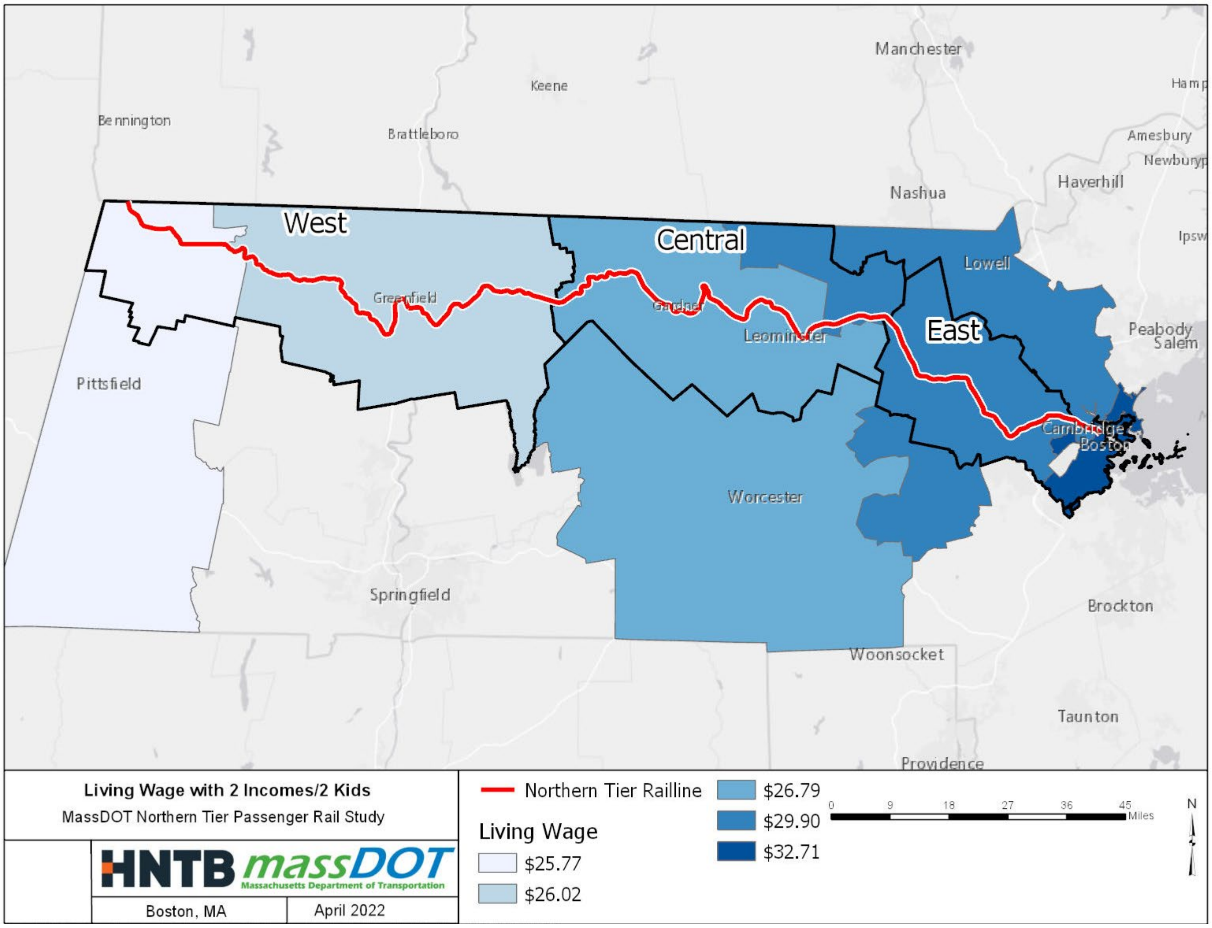
[9] Pew Research Center, The Future of World Religions: Population Growth Projections, 2010 – 2050, 2015.

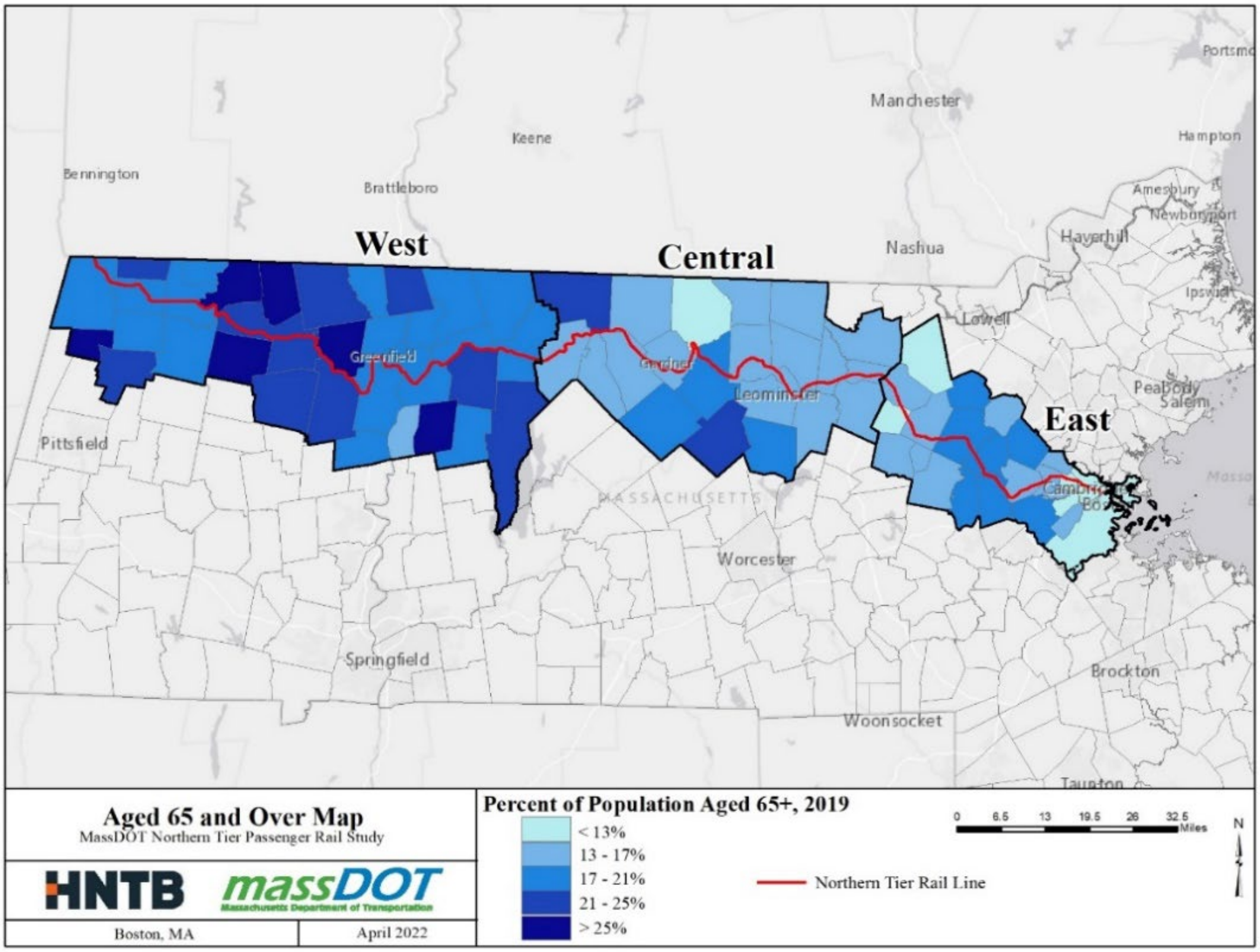
Figure 3.21: Living Wage by County



Source: Living Wage Calculator

Eastern Massachusetts has a higher proportion of working-age residents (34%) compared to the West (22%) and Central (25%) portions of the corridor due in part to the number of higher education institutions in the area and its large employment base. Conversely, the West and Central segments have higher proportions of older workers, approximately 30 percent of their populations in the 45 – 64-year group compared to 23% in the East segment.

Figure 3.22: Percentage of Population Aged 65 and Over within the Northern Tier Corridor



Source: American Community Survey

Environmental Justice

At 20%, the East segment has the highest proportion of households earning above $200,000 per year. The West segment, at nearly 25%, has the highest proportion of households earning within the $10,000 to $35,000 bracket.[10] All three segments have three to seven percent of households earning less than $10,000 per year.

The share of households making over $200,000 in the East segment is more than twice as high as the Central segment and four times as much as the West segment. Further, almost half of all households in the East segment earn more than $100,000 annually which could be attributed to the Boston suburbs of Lexington, Lincoln, Concord, and Acton. Figure 3.23 shows the percentage of population below the poverty level across the corridor in 2019.

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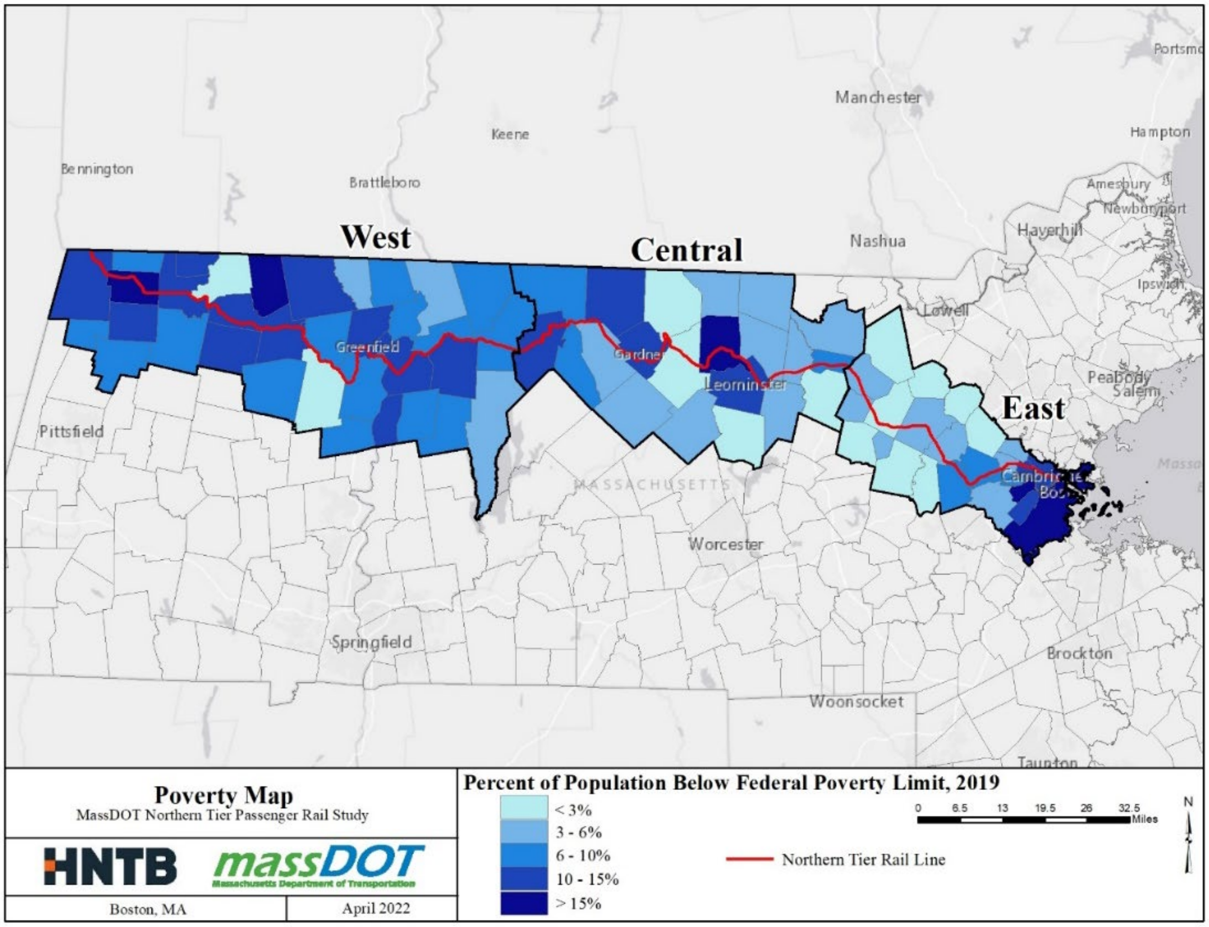
[10] Depending on household size, many of those households would fall below the poverty line.

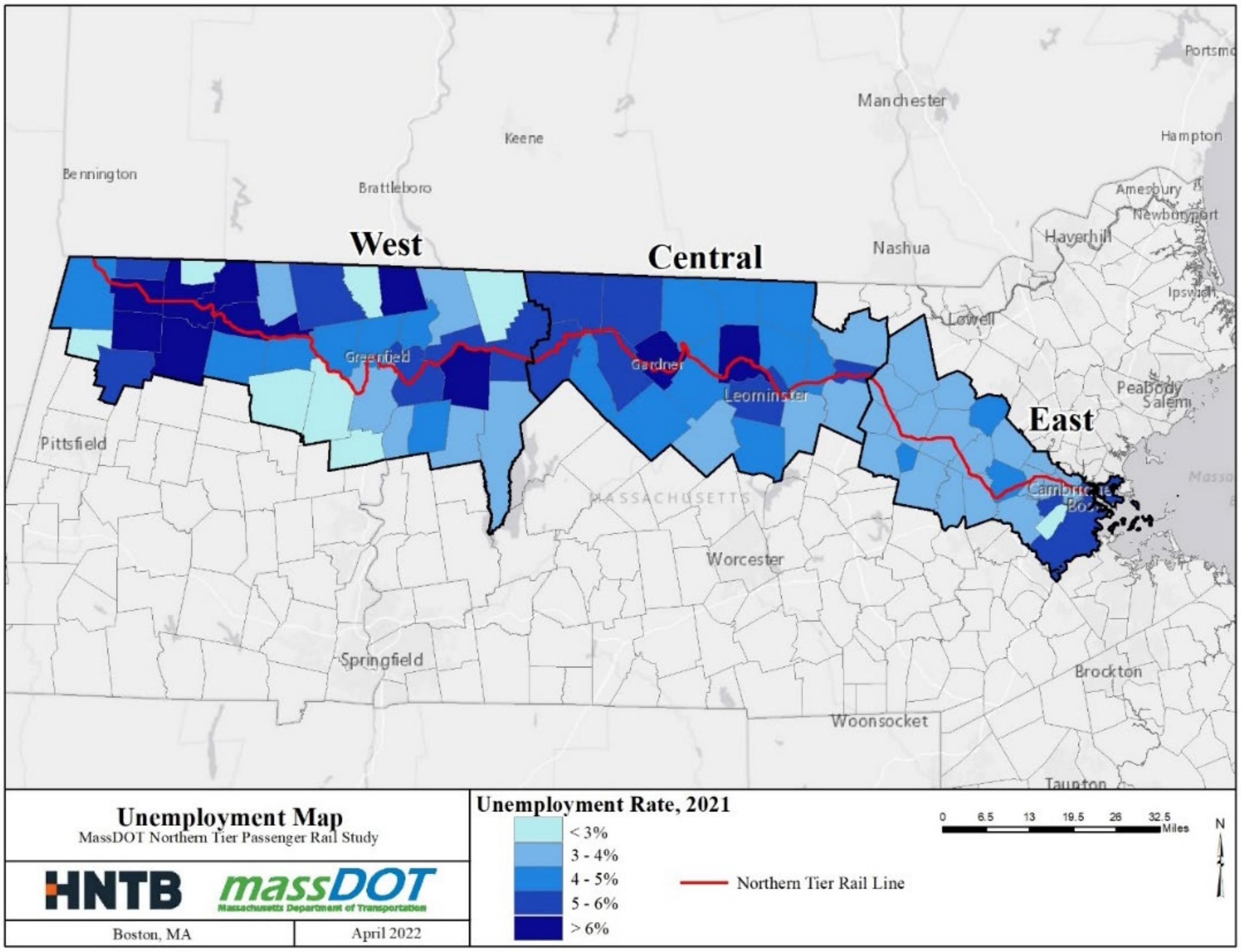
Figure 3.23: Percentage of Population Below Federal Poverty Limit within the Northern Tier Corridor



Source: American Community Survey

In 2021, the statewide average unemployment was 5.7%, similar to the unemployment rate in the West segment. During this timeframe, the unemployment rate in the East segment was 4.9% and was 6.1% in the Central segment (Figure 3.24).

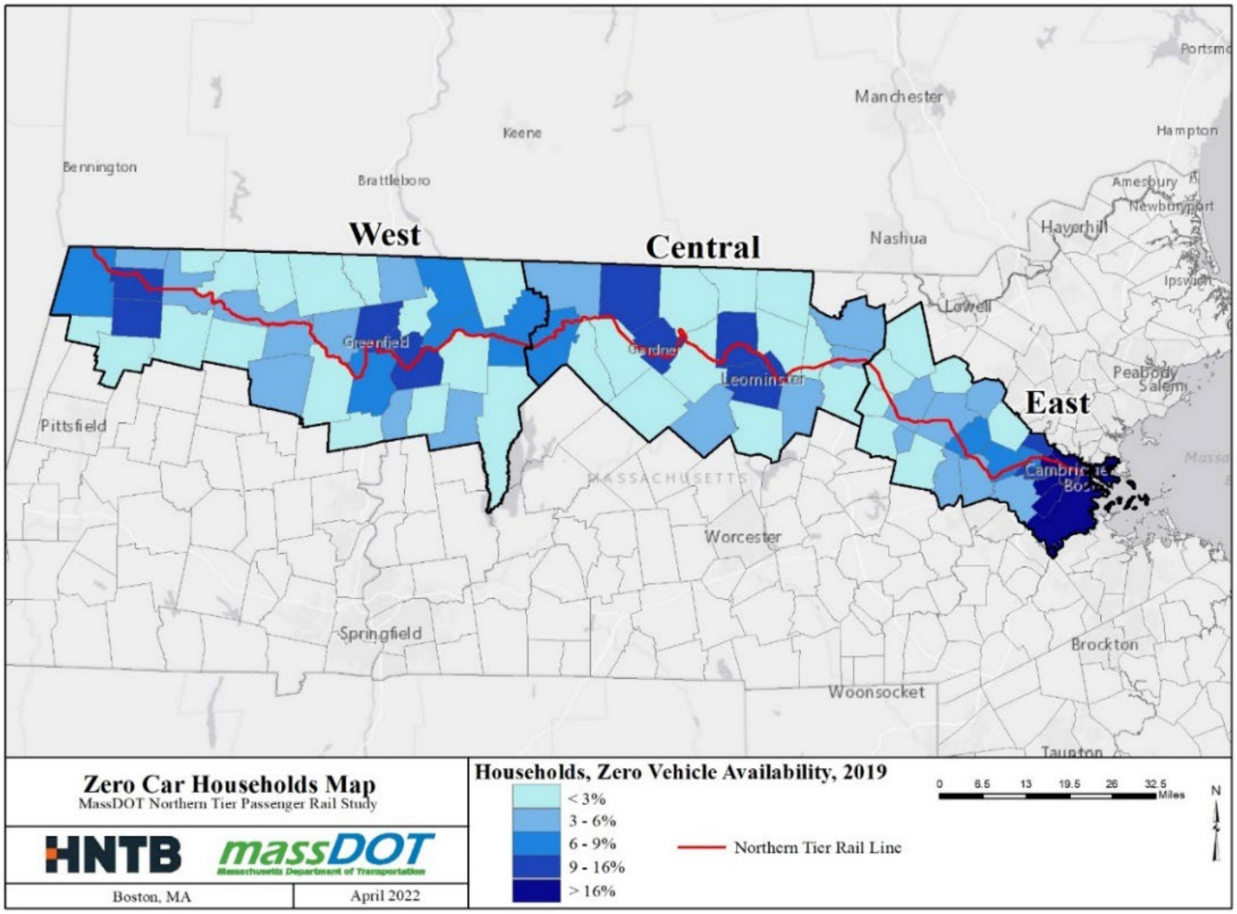
Figure 3.24: Unemployment Rates within the Northern Tier Corridor



Source: American Community Survey

The East segment of the Northern Tier corridor has higher rates of zero-car households than either the Central or West segments, shown in Figure 3.25. This difference is largely driven by the town of Brookline and the cities of Boston, Cambridge, and Somerville, and could be attributed to the large numbers of students, high population density, significant parking constraints, and comprehensive public transit services in these and other nearby areas. While overall low levels of zero-car households in both the Central and West segments may reflect low-density land use and a lack of reliable and frequent public transportation service, a lack of vehicle ownership was identified in communities along the corridor, including Fitchburg, Gardner, and North Adams.

Figure 3.25: Zero-Car Households within the Northern Tier Corridor



Source: American Community Survey

Economic Development and Related Factors

Between 2010 and 2019, the East segment experienced employment growth of 20% while Central and West saw growth rates of 14% and four percent, respectively. About two-thirds of the jobs in Massachusetts are not in the Northern Tier corridor. Together, the Central and West segments comprise between three and four percent of all Massachusetts jobs.

The cost of living in Suffolk County is 27% higher than Berkshire County, 26% higher than Franklin County, and 22% higher than Worcester County. An analysis of Massachusetts Association of Realtors data on 2021 single family and condominium home sales shows higher home values along the stretch of the Northern Tier corridor between Boston and I-495 as compared to further west.

Tourism Trends and Major Attractions

Tourist attractions are located across the corridor, including educational, healthcare, and other significant activity centers. Major activity centers in the Central segment include: Wachusett Mountain & Reservation, Great Wolf Lodge, Devens, Fitchburg State University, and the University of Massachusetts Memorial Health Alliance Clinton Hospital. Activity centers in the West segment include Franklin County Fairgrounds, Baystate Franklin Medical Center, Massachusetts Museum of Contemporary Art, Clark Art Institute, and the Berkshire East Mountain Resort.

Major activity centers in the East segment include:

- Boston-area medical facilities (e.g., Massachusetts General Hospital)
- Sports facilities (e.g., TD Garden, Fenway Park)
- Higher educational institutions (e.g., UMass-Boston)
- Large employers (e.g., state government)
- Tourism destinations (e.g., the Freedom Trail, Faneuil Hall)
- Recreational facilities (e.g., the Minuteman Trail)

Travel Patterns

Community-level travel patterns for Northern Tier communities throughout the Commonwealth were assessed using StreetLight Location-Based Services (LBS) data. Aggregations of this travel data are reported for the three segments along with the remainder of the Commonwealth in Table 3.2 and Table 3.3. Compared to 2019, travel volumes were lower in 2021, likely due to the COVID-19 pandemic and the resulting increase in work from home, remote learning, telemedicine, etc.

Table 3.2: StreetLight 2019 Average Daily Trips - All Modes by Segment

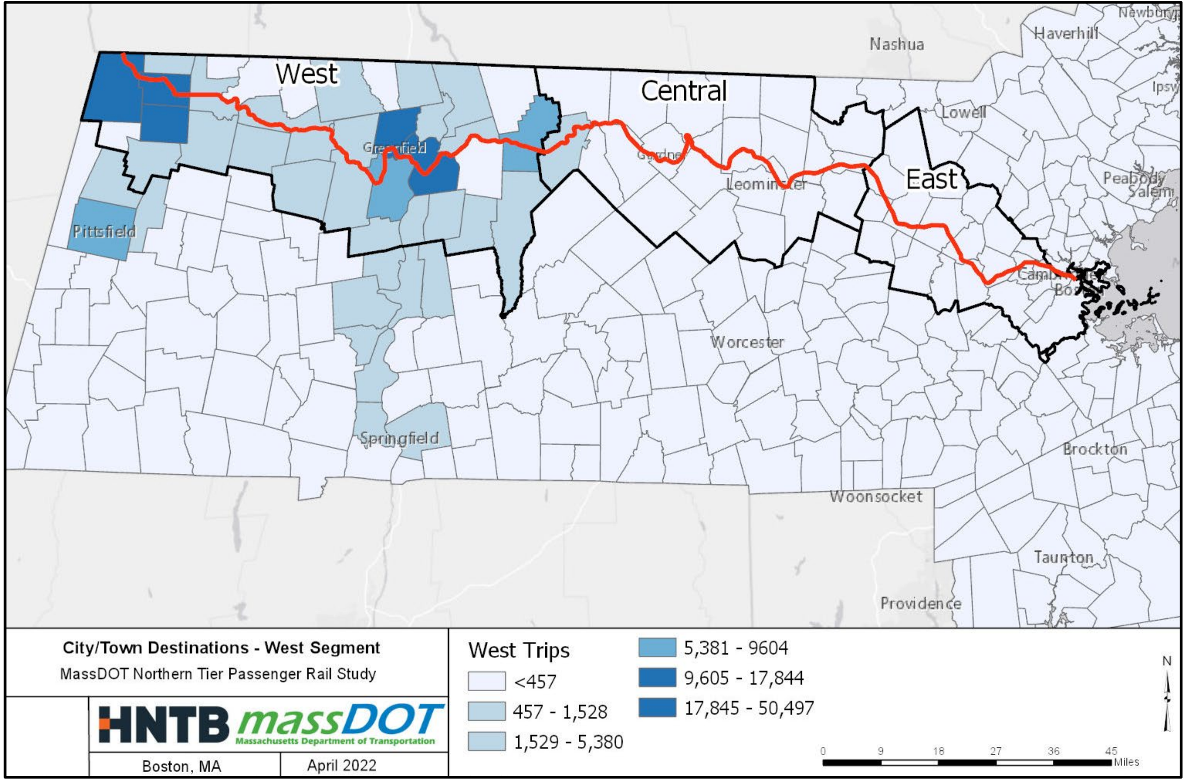
		Destination				
	Segment	**West**	**Central**	**East**	**Other**	**Total**
Origin	**West**	198,804	6,844	359	30,217	236,224
	Central	7,322	484,122	23,765	66,194	581,403
	East	360	24,448	3,004,703	830,564	3,860,075
	Other	31,156	66,893	815,621	13,771,833	14,685,503
	Total	237,642	582,307	3,844,448	14,698,808	19,363,205

Table 3.3: StreetLight 2021 Average Daily Trips and Percent Change – All Modes by Segment

		Destination					
		West	**Central**	**East**	**Other**	**Total**	**2019 to 2021 Change**
Origin	**West**	156,553	5,113	326	28,425	190,417	-19%
	Central	5,476	383,284	20,658	58,085	467,503	-20%
	East	343	21,394	2,079,638	598,124	2,699,499	-30%
	Other	29,674	59,849	579,870	10,998,734	11,668,127	-21%
	Total	192,046	469,640	2,680,492	11,683,368	15,025,546	-22%

The majority of daily trips stay within the segment of the Northern Tier corridor from which they originate: 82% for West and Central segments and 77% for East. Trip levels decrease as they travel farther away from their origin. The East segment shows a strong orientation toward communities in and around Boston. The Central segment shows Fitchburg, Leominster, and Gardner as the top three destinations for trips originating in the segment. The West segment has a strong north-south orientation for trips, suggesting that many people living in the region travel to Pittsfield and Springfield for work, medical care, or other trip purposes. Figure 3.26 shows trip destinations originating from the West segment.

Figure 3.26: Trips Totals to Municipality, West Segment



Source: StreetLight

Work Trips in the Corridor

The majority of total trips stay within the individual segment for the Central and West segments. The data demonstrates that the East segment has more daily work trips than the Central or West segments and, while the East captures considerable numbers of work trips from the Central segment and some from the West, there is very little commuting traffic from the East into the other two segments. Table 3.4 shows that while the majority of total trips stay within the individual segment for the Central and West segments, trips that move between segments are more likely to be for work.

Table 3.4: Work Trip Proportion by Segment (2019)

		Destination				
		West	**Central**	**East**	**Other**	**Total**
Origin	**West**	16%	22%	95%	53%	21%
	Central	17%	12%	63%	47%	19%
	East	15%	13%	18%	16%	17%
	Other	21%	27%	57%	14%	17%
	Total	17%	14%	26%	14%	17%

Source: American Community Survey and StreetLight

Trip Mode Share in the Corridor

Mode share is the relative percentage of users of each mode of transportation, i.e., automobile, walk, bus, rail. Mode share data is developed from the American Community Survey and is based on work trips.

West of I-495, travel in the corridor is predominantly by motor vehicle use. In the West segment of the corridor (Franklin and north Berkshire Counties), 85% of work trips are taken by car. In the Central segment (I-495 to Athol/Orange), 92% of work trips are taken by car. In contrast, the East segment (inside I-495) has 64% of its work trips taken by car; the remainder of trips are split between active transportation, transit, and working from home. The West and Central segments both have higher levels of automobile use than the state average (at 85% and 92%, respectively versus the state average of 84%). The proportion of auto use in the West segment is only slightly higher than statewide averages. The Central segment has the highest level of auto use at 92%.

There is variation in communities' mode shares in the western part of the corridor. North Adams has the lowest auto mode usage at 82%, while Athol has the highest at 92%. Both are higher than the Greater Boston Area, which has an auto share of just under 70%. These variations, similar to overall segment trends, are likely a result of the number of transportation options, the size of the working age population, and household income distributions. Local regional transit authority service provides a small share of overall trips (less than two percent).

Auto Travel Patterns

Current travel conditions for the corridor were assessed using INRIX (location-based data and analytics) travel data. The average daily travel times to urban centers along the corridor were estimated, including average and morning peak travel times. These travel times are benchmarks for comparison with potential rail service along the Northern Tier corridor.

Preferred travel routes (defined as 80% or higher) by car between different origin-destination pairs were also analyzed. The top route for each of the origins (North Adams, Greenfield, Orange/Athol, Fitchburg/Leominster) to Boston/Cambridge is the Route 2 corridor, with a much smaller proportion of travel going along the I-90 (the Massachusetts Turnpike, or Mass Pike). The average travel time by automobile between Boston and North Adams is 2.5 hours using Route 2. The Fitchburg Commuter Rail Line scheduled travel time between the two stations is 1 hour, 37 minutes.

Figure 3.27: Daily North Adams to Boston Travel Patterns

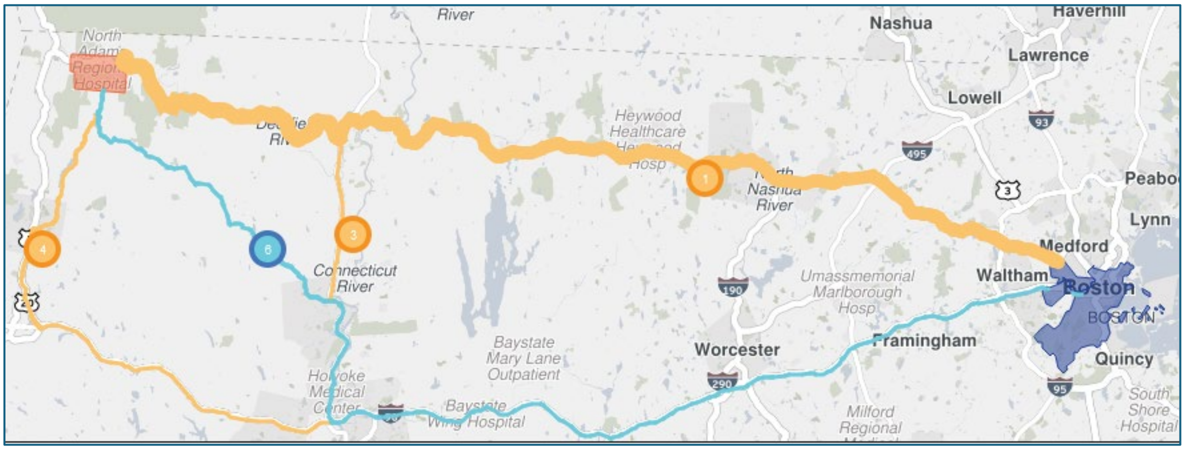


Table 3.5: North Adams to Boston Route Choice

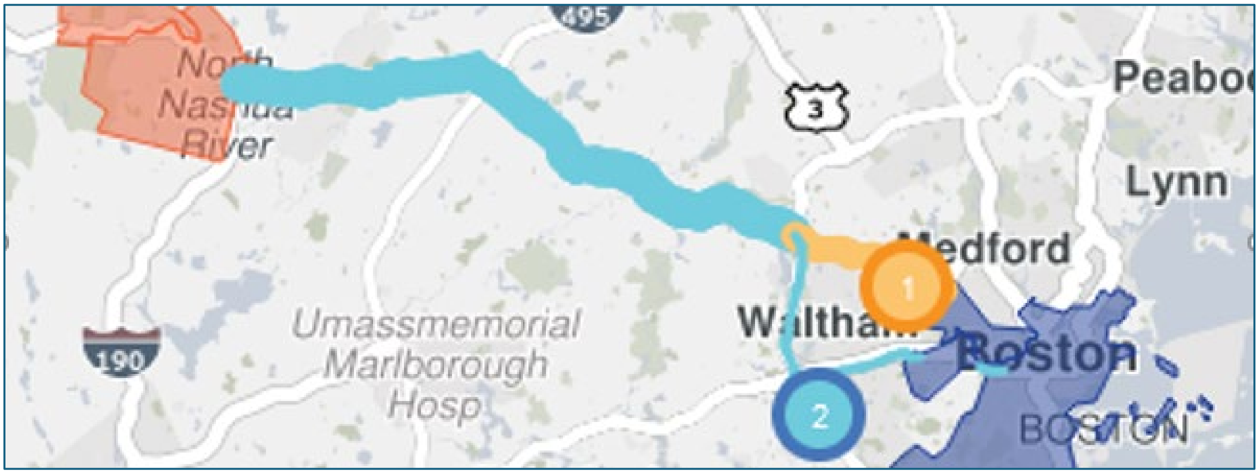
Route	Percent Trips	Length (mi)	Travel Time	Avg TT	Min TT	Max TT	Reliability*
1	80%	120	2:31:10	2:34:37	1:58:20	3:30:42	1.12
3	8%	149.26	2:42:25	2:45:23	2:12:50	3:33:42	1.08
4	7%	147.81	2:46:10	2:46:45	2:29:49	3:13:16	1.02
6	5%	138.62	2:39:39	2:48:12	2:26:44	3:15:43	1.22

*Reliability is calculated as the ratio of the 80th percentile travel time to the 50th percentile travel time
Source: INRIX Data

Approximately 80% of trips along the full corridor use Route 2 and is consistently the fastest route, which attributes to its reliability.[11]

Closer to Boston, trips along the corridor also divert from Route 2. The diversion is due to congestion or the location of the driver's final destination.

Figure 3.28: Daily and AM Peak Fitchburg/Leominster to Boston Travel Patterns



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[11] Reliability is measured as the ratio of the 80th percentile travel time to the 50th percentile travel time. The closer the value is to 1, the more reliable the route. Reliability is not an indication of the fastest route; it is an indication of the consistency of the route.

Table 3.6: Daily Travel Data and AM Peak Travel Data

Daily Travel Data							
Route	Percent Trips	Length	Travel Time	Avg TT	Min TT	Max TT	Reliability
1	65%	32.68	0:32:17	0:33:07	0:23:16	1:14:05	1.16
2	35%	32.69	0:28:03	0:28:32	0:23:35	0:40:21	1.07
AM Peak Travel Data							
Route	Percent Trips	Length	Travel Time	Avg TT	Min TT	Max TT	Reliability
1	72%	32.68	0:37:41	0:43:58	0:18:51	2:16:05	1.43
2	28%	39.4	0:56:27	1:00:11	0:31:28	2:01:45	1.29

The AM peak is more congested and less reliable than the average daily travel time patterns due to the high concentration of work trips traveling to Boston in the morning from within the corridor and also along I-90. The INRIX data shows that the average travel time from Fitchburg/Leominster to Boston using I-90 doubles in the AM peak compared to the daily peak. This congestion on I-90 may also contribute to trips in the Route 2 corridor remaining in the Route 2 corridor as it is relatively uncongested compared to other travel paths.

Other Travel Modes
West of Charlemont, there is no public transportation service until North Adams, which is served by Berkshire Regional Transit Authority. Furthermore, there has not been any intercity bus service available along the corridor since it was discontinued in 2018.
Fitchburg, Leominster, and other stations in the eastern segment of the corridor are served by the MBTA Fitchburg Commuter Rail Line with approximately 14 weekday roundtrips and eight weekend roundtrips to North Station in Boston. The line provides hourly weekday service and every two hours on weekends between Wachusett Station in Fitchburg and North Station.

Projected Travel Trends
Building upon the analysis of the current travel market characteristics, projected travel trends were developed. This projection process assumes that the overall pattern of existing trips will continue, that is, people will continue to travel between the same origins and destinations. The projection process also assumes that changes to the origins and destination of trips within these travel patterns will depend on projected future changes in population and employment. That is, increases or decreases of persons travelling in these patterns are based on projected increases or decreases in population and employment. Estimating future travel trends does not include estimating changes in the travel patterns and travel markets that result of changes to the transportation system, in this case, a Northern Tier passenger rail service. Projected travel trends are used to help develop ridership estimates for the potential service alternatives. These ridership estimates are developed by analyzing travel market trends in light of the characteristics of the new transportation service to estimate how many people may move from their existing travel mode (e.g., automobile) to the Northern Tier service. The ridership estimates are developed by using the projected total travel

market trends. The new transportation service is introduced to this total travel market to estimate how persons from these markets may choose to use the new mode.

Trip tables for 2019 have been projected to 2040 based on the population and employment growth, respectively, of each community.

Table 3.7: Segment-Level Projected Streetlight 2040 Average Daily Vehicle Trips

		Destination				
		West	**Central**	**East**	**Other**	**Total**
Origin	**West**	189,200	7,000	330	29,100	225,600
	Central	6,700	467,300	22,700	62,700	559,400
	East	400	25,500	3,197,400	937,200	4,160,400
	Other	30,100	69,100	815,100	13,798,900	14,713,300
	Total	226,400	568,900	4,035,500	14,827,900	19,658,800

Most overall travel is projected to remain within each segment area, with little interplay between the West and East segments. Projections for work trips show a similar pattern. Most work travel is projected to occur within the East segment, with the Central segment having a stronger orientation eastward.

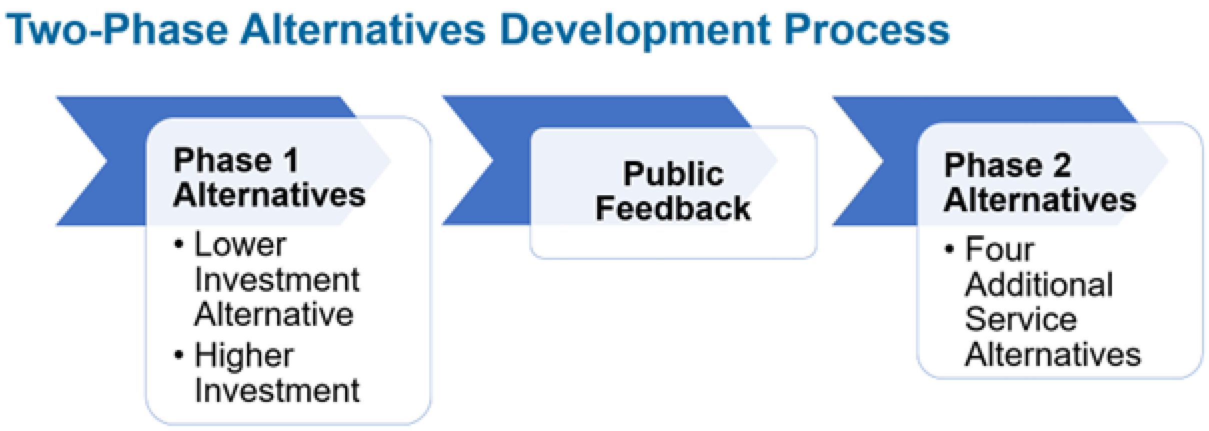
When examining projected job growth/decline by region, the East segment again leads both for the 2010-2020 period and the forecasts for the 2020-2040 period. The Central segment is currently projected to see a slight decline in jobs between now and 2040. The West segment may see its economy, at least in terms of the number of jobs, diminish at an accelerating pace over the next 20 years.

Overall, population and employment are estimated to decline in the West segment of the corridor. In the Central segment, population is expected to grow modestly with declining employment. Although work-from-home flexibility has recently introduced considerable uncertainty about this trend, it is estimated that the demographic dynamics will continue without some major intervention or disruption.

CHAPTER 4: ALTERNATIVES DEVELOPMENT AND EVALUATION

To illustrate a range of possible options for new intercity passenger rail service along the corridor, alternatives were developed and evaluated based on the established goals, objectives, and evaluation criteria, as well as identified challenges and opportunities. Using a two-phase alternatives development approach, the process began with the development and evaluation of two potential initial service alternatives representing lower investment and higher investment scenarios. With feedback from the Working Group and the public, the two initial service alternatives were refined, and four additional alternatives were developed and assessed as part of Phase 2.

Figure 4.1: Alternatives Development Process


Two-Phase Alternatives Development Process
Phase 1 Alternatives
• Lower Investment Alternative
• Higher Investment
Public Feedback
Phase 2 Alternatives
• Four Additional Service Alternatives

Each service alternative incorporates differing characteristics (e.g., stations served, travel times, etc.) and associated metrics (e.g., ridership, costs, etc.) to measure how these elements interact with one another and how well the alternatives meet the goals and objectives of the study.

Alternatives Development

Phase 1 of the alternatives development process began with an assessment of existing track conditions and travel patterns in order to develop the initial two service alternatives. Each alternative consists of a combination of infrastructure and service characteristics including stations, coverage area, service structure, frequency of service, span of service, travel time between stations, and physical improvements (outlined in Figure 4.2).

Figure 4.2: Service Characteristics

Ingredient	Range of Options
Stations	• Increase or decrease number of stations • Locations could change
Coverage Area	• Limited to Massachusetts vs. extended into Vermont and New York
Service Structure	• Direct service to Boston vs. transfer to other services (e.g., MBTA Commuter Rail, Valley Flyer)
Frequency of Service	• Increase or decrease number of daily trains
Span of Service	• Full day service vs. commuter peak • Daily vs. seasonal
Travel Time Between Stations	• Existing freight train speeds to full high-speed rail (slow to very fast)
Physical Improvements	• Incremental State of Good Repair, full reconstruction in existing alignments, new alignments

Stations and Coverage Area

The number of stations and their locations can affect markets served based on the coverage area. Market and ridership analysis determines the coverage area. The coverage area is the area around a station from which riders would be attracted to the proposed passenger rail service. The number of stations can affect travel time. For each station stop, a train must reduce its speed over a given distance in order to stop safely. Each station stop has a prescribed dwell time to allow passengers to alight with their luggage and for other passengers to board the train. Additional time is added to the train schedule because the train gradually accelerates to the allowed track speed.

Service Structure

One-seat ride point-to-point (e.g., boarding in North Adams and taking the train to the final destination, for example, Boston North Station), or a two-seat ride (e.g., leaving North Adams, changing trains in Fitchburg to take the MBTA Commuter Rail service to Boston).

Frequency of Service

The frequency of service is the number of trains per day operated plus the days and times they operate. This service element can directly affect ridership. Travel purpose, the days that service is offered, and the frequency can all affect travel mode decisions. Short-term leisure travel such as sporting events may become easier with more frequent service. Weekend or longer vacation travel may not need higher frequency train service.

Span of Service

The span of service is the number of hours in a day that service is offered. A long span of service, 6 am to 11:30 pm for example, may provide the opportunity for round trip travel on one day and attract riders whose trip purposes match that availability.

Travel Time Between Stations

Travel times between the end stations and between other stations can be important for end-to-end riders and for intra-corridor customers. Trip times that are competitive with other modes for various trip purposes can produce higher ridership.

Physical Improvements

Physical improvements are the capital construction of track and other system improvements (e.g., signal) to increase train speeds or improve operations and reliability, examples of this include replacement of railroad ties and ballast, realigning track curves and adding superelevation, and/or constructing new track alignments. All of the alternatives assume that Northern Tier passenger rail service would share the right of way with the MBTA Commuter Rail service on the Fitchburg Line and the PAS right of way with freight service. Specific double tracking and other improvements are identified based on the modeling results for each alternative. The modeling results showed that all three types of rail service could be operated compatibly on the existing rights of way, so that an additional corridor or right of way would not be required.

Another element to consider is vehicle type. The type of train equipment used affects top train speeds, passenger capacity and acceleration. The most common types of equipment for intercity passenger service are coaches hauled by locomotives. Sometimes these trains have a control unit on the non-locomotive end that allows the train to be driven from both ends. There are several types of locomotives in passenger service today: diesel electric, high speed or Genset, electric locomotives, and dual mode. All of these locomotives can achieve higher horsepower and therefore speed than the traditional diesel locomotive, with the electric engine being the best performer. All of these units can comply with environmental regulations. The emission status of the electric locomotive would depend on the fuel used at the power source. Intercity passenger coaches tend to have fewer seats and more amenities than commuter coaches in order to allow for more comfort during a longer ride.

Phase 1 Alternatives

As part of Phase 1, two initial alternatives were designed to demonstrate the types of service that could result from different levels of investment in the corridor infrastructure outside of the MBTA service area. Alternative 1 (the lower investment alternative) minimizes the level of infrastructure investment, while Alternative 2 (the higher investment alternative) identifies infrastructure investments that could enable rail travel times that are equivalent to vehicle travel times from North Adams to Boston.

Rail travel times comparable to auto travel were achieved without the need for constructing new track alignments outside of the existing right-of-way. The main elements of the initial service alternatives are similar with some key exceptions.

Alternative 1: Lower Investment

Improvements included in Alternative 1 are the minimum steps necessary to operate passenger trains, eliminate the low-speed segments that would have significant impacts on travel times, and create additional track capacity to accommodate planned operations, as shown in Figure 1. The characteristics for Alternative 1 were developed to serve a variety of trip purposes and to serve the population centers of North Adams and Greenfield, as included in the founding legislation.

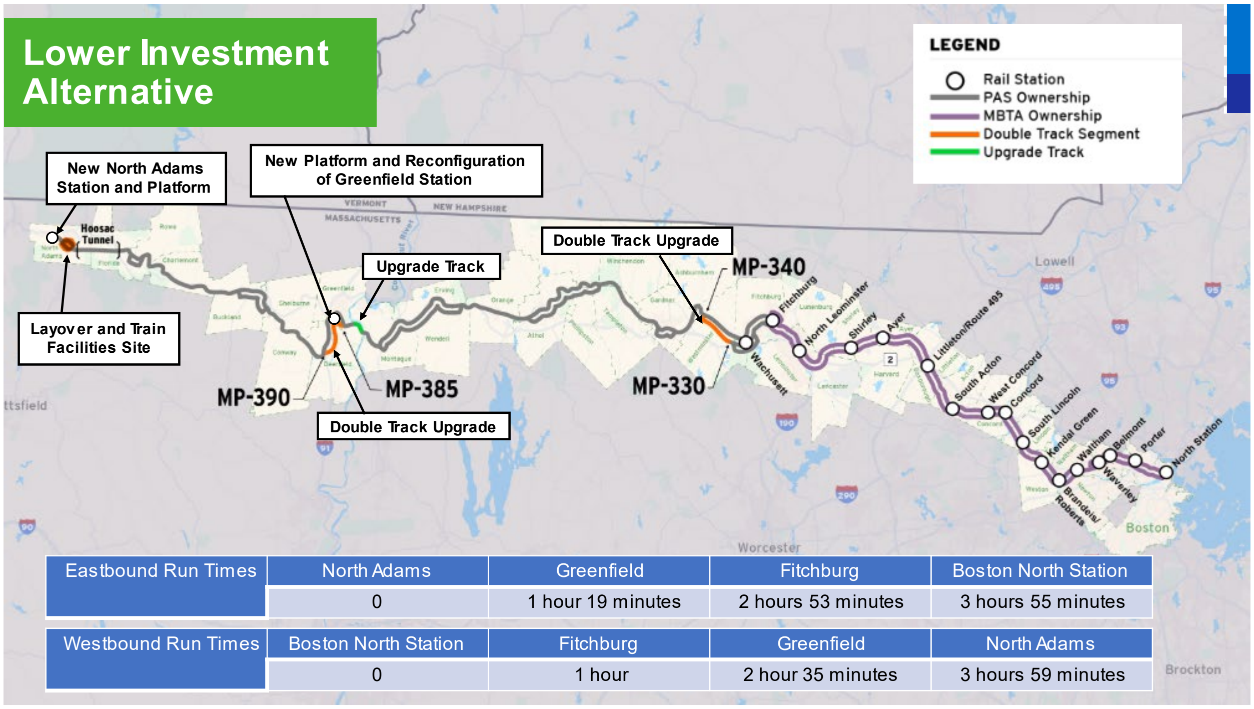
Alternative 1 would reintroduce service between North Adams and Boston and include four station stops: North Adams, Greenfield, Fitchburg, and Boston North Station. Passengers would use the MBTA Fitchburg Commuter Rail Line in Fitchburg to connect to intermediate stations between Fitchburg and Boston North Station. With five round trips per day, Alternative 1 would feature the following service patterns to serve differing trip purposes:

- From North Adams - one morning peak train, two midday trains, one evening peak train, one evening train
- From Boston North Station – two off-peak trains, one evening peak train, one evening train, one late evening train

Alternative 1 would take 3 hours and 55 minutes from North Adams to Boston North Station, utilizing diesel locomotive and coaches comparable to those operated on the Valley Flyer service. The assumed vehicles are consistent with those of typical Amtrak intercity passenger operation, which are capable of higher speeds on certain track curves. All infrastructure improvements are assumed for the PAS trackage between Fitchburg and North Adams; no improvements were assumed for the MBTA-owned Fitchburg Line.

Alternative 1 would improve signals (including Positive Train Control), upgrade Class 1 track at East Deerfield Yard, add trackage to support capacity improvements, and feature a new station and platform in North Adams, a new layover and train facilities site in North Adams, as well as a new platform and reconfiguration of the station in Greenfield. Additional double track would be built in Greenfield and Westminster. While Alternative 1 would not change superelevation on PAS corridor, the improvements included in Alternative 1 would enhance track capacity and allow higher speeds along the corridor from Fitchburg to North Adams.

Figure 4.3: Lower Investment Alternative



Eastbound Run Times	North Adams	Greenfield	Fitchburg	Boston North Station
	0	1 hour 19 minutes	2 hours 53 minutes	3 hours 55 minutes

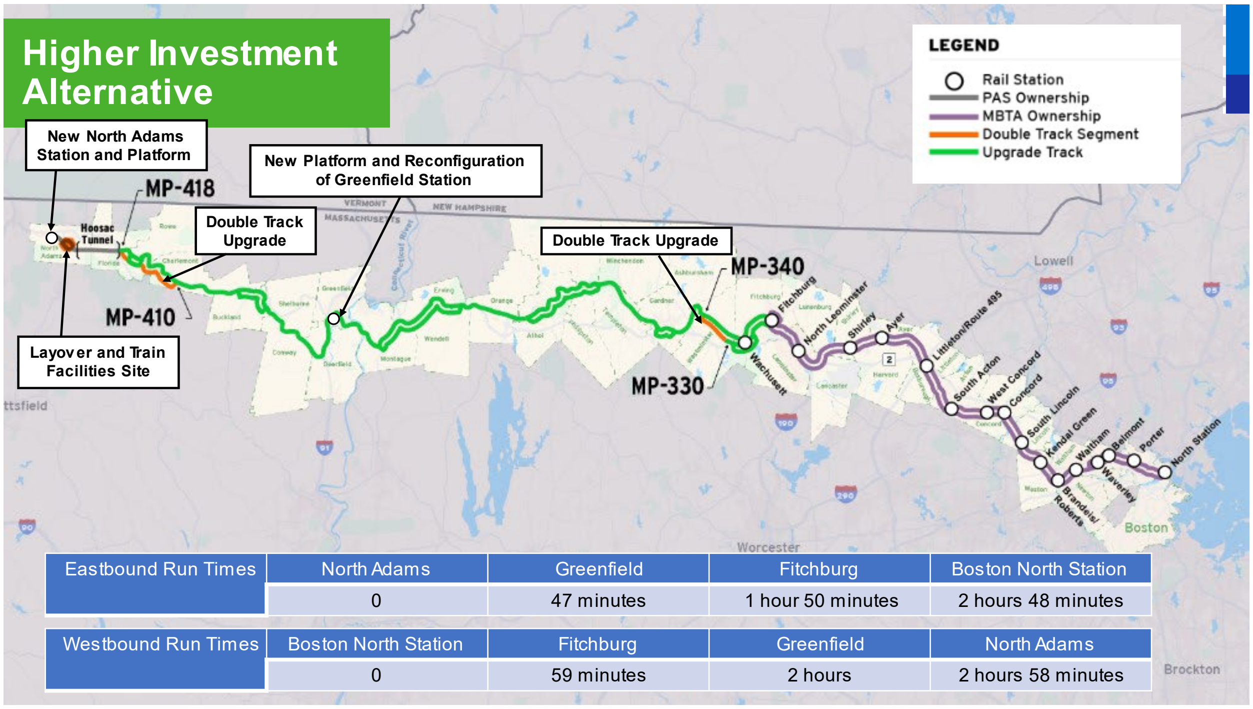
Westbound Run Times	Boston North Station	Fitchburg	Greenfield	North Adams
	0	1 hour	2 hour 35 minutes	3 hours 59 minutes

Alternative 2: Higher Investment

Alternative 2 would serve the same set of trip purposes as Alternative 1 and feature the same stations and vehicle type. The infrastructure in Alternative 2 would include further track rehabilitation and improvements to support superelevation and increase the track class to support enhanced capacity from Fitchburg to North Adams. Additional double tracking would be built in Westminster, Rowe, and Charlemont. These higher speeds and capacity further improve trip time and efficiency. Similar to Alternative 1, all infrastructure improvements are assumed for the PAS trackage between Fitchburg and North Adams, and not on the MBTA-owned Fitchburg Line.

As a result of these additional improvements, Alternative 2 would take 2 hours and 48 minutes from North Adams to Boston North Station, as shown in Figure 4.4.

Figure 4.4: Higher Investment Alternative



Eastbound Run Times	North Adams	Greenfield	Fitchburg	Boston North Station
	0	47 minutes	1 hour 50 minutes	2 hours 48 minutes

Westbound Run Times	Boston North Station	Fitchburg	Greenfield	North Adams
	0	59 minutes	2 hours	2 hours 58 minutes

Table 4.1: Comparison of the Lower and Higher Investment Alternatives

Assumptions	Lower Investment	Higher Investment
Track Infrastructure Improvements	Limited to signal improvements (including PTC) and upgrade of Class 1 track at East Deerfield Yard; some trackage additions to support meet-pass locations; no change in superelevation on PAS corridor	More track rehabilitation and improvements to support superelevation and increase in track class to fully use capability of the train to match superelevation; some trackage additions to support meet- pass locations
Service Type	One-seat ride from North Adams to Boston North Station	

Number of Stations	4 (North Adams, Greenfield, Fitchburg, Boston North Station)
Frequency	5 trains daily (1 morning peak, 2 midday, 1 evening peak, 1 evening)
Schedule Times	Schedule times selected for trip purposes; secondary bias toward connection with North-South Service at Greenfield
Other uses of ROW	Assumes MBTA Commuter Rail schedules and freight trains
Dwell Time at Stations	2 minutes
Equipment Type	Diesel trains with Amfleet passenger cars and same consist as Valley Flyer
MBTA Infrastructure	No modification to MBTA infrastructure

Evaluation of Phase 1 Alternatives

To assess how well the initial service alternatives would meet the needs outlined in the goals and objectives for the study, the Phase 1 alternatives for passenger rail service were measured against these goals and objectives using the following criteria:

- Mobility and access
- Economic impact
- Social equity and fairness
- Impacts on rail capacity
- Environmental and cultural resources
- Cost effectiveness
- Safety and air quality

Ridership and cost estimates (both capital and operations and maintenance), as well as additional metrics, became the basis for estimating the array of benefits and costs for each alternative and the following alternatives evaluation.

Operations Modeling

Developing each alternative requires the use of a Rail Traffic Controller (RTC), an industry-standard software model. The RTC model produces characteristics of the resulting train service, including the schedules and station to station travel times. The model requires several inputs (or types of information) about the current railroad infrastructure, including track condition, track geometry, track configuration, train schedules, signal control systems, and grade crossings. Other model inputs include the proposed service alternative elements such as desired travel times, schedules of other trains (MBTA Commuter Rail trains and PAS freight trains) in the model area, stations, and station dwell times.

The model processes the information and produces graphical representations and data about how the trains could operate. The model outputs include the schedule adjustments or infrastructure improvements needed to meet the required elements of each alternative. For example, when the model identifies locations where two trains are operating in opposite directions on the same segment of single track, the issue may be resolved by an adjustment to the schedule to avoid the conflicting use on the single track. The model is then rerun with the new schedule to attempt to resolve the conflict. If the conflict cannot be resolved via a schedule change, then a "meet-pass location" is noted.[12] Higher train speeds also could increase right-of-way capacity by allowing more operations on the same track. In this way, the model is a primary tool for identifying necessary infrastructure investments for each service alternative.

In addition to track occupancy charts and detailed train status information, the RTC provides animations of train movements, operating statistics, time-distance diagrams, and train performance calculator profiles displaying information on elevations, speeds, throttle, brake settings, and cumulative distance. Among the most important outputs of the RTC model is the travel time for each alternative. Travel time information is critical for estimating potential ridership. Ridership can then be used to determine other measures of effectiveness or potential benefits, such as environmental benefits. Travel time also is a function of train speeds and is a measurement of train efficiency.

Estimation of Ridership

Forecasting ridership for a new rail service requires the review of various data sources that provide analogies, or examples, of the magnitude of ridership that could develop. Varying data sources may provide different insights into potential ridership patterns.

Three primary data sources were used to develop the initial forecast models:

- MBTA Commuter Rail Service Data: MBTA Commuter Rail station-level data for the number of daily boardings, frequency of service, travel time, and travel distance to Boston by station.
- StreetLight Location-Based Services Data (LBS): Anonymized geographic data processed to determine travel patterns throughout the Commonwealth, including daily trips in the spring and fall recorded between the catchment areas[13] of stations along the Northern Tier corridor.
- Amtrak *Downeaster* data: station to station origin-destination data, trip data, and travel times for estimation on intra-corridor trips.

Ridership Methodology

A three-phase approach was originally developed to estimate passenger volumes for the first phase alternatives, which is shown in Figure 3. A passenger rail boarding model was developed which first estimates the number of boardings at each station along the proposed route using linear regression, which employs a statistical process to predict the value of a variable based on the value of other variables, in this case predicting passenger station boardings based on population and the relationship between travel time by auto and proposed train service. The number of daily boardings at each station are estimated based on the average daily LBS trips, starting with an estimated ridership based on MBTA Commuter Rail ridership behavior. As the Northern Tier service alternatives run fewer daily trains than the MBTA Commuter Rail, the effect of service frequency on the number of boardings was accounted for by adjusting the modeled boardings based on headway elasticity calculated from the ridership levels on the Amtrak Downeaster.

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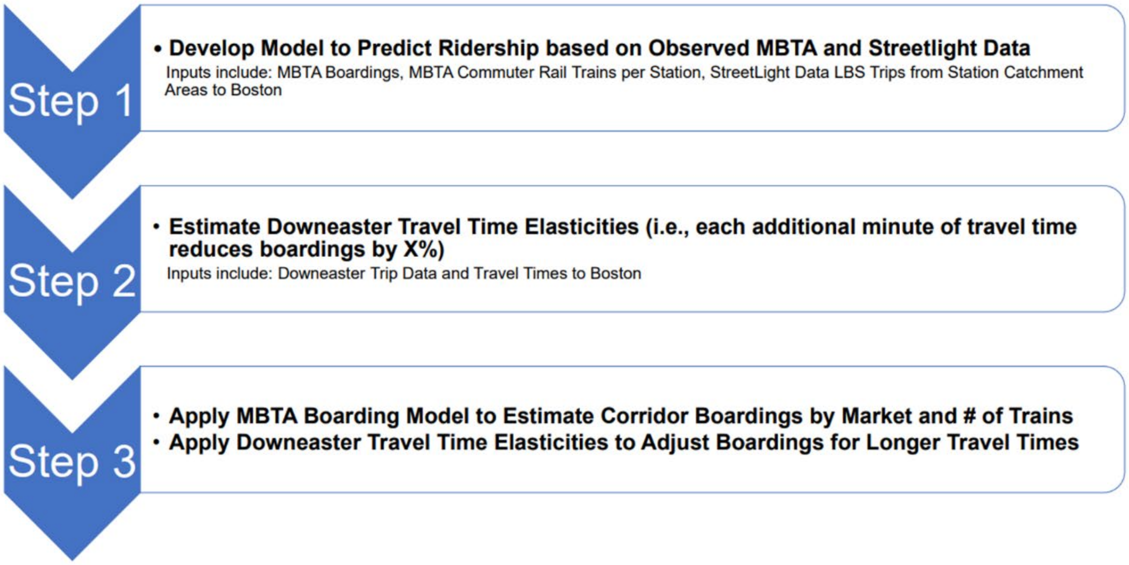
[12] This is a location where double tracking would be constructed so two trains could operate in the same route segment at the same time.

[13] The area from which ridership to each station is drawn.

Figure 4.5: Initial Ridership Estimation Process



Step 1

- **Develop Model to Predict Ridership based on Observed MBTA and Streetlight Data**
  Inputs include: MBTA Boardings, MBTA Commuter Rail Trains per Station, StreetLight Data LBS Trips from Station Catchment Areas to Boston

Step 2

- **Estimate Downeaster Travel Time Elasticities (i.e., each additional minute of travel time reduces boardings by X%)**
  Inputs include: Downeaster Trip Data and Travel Times to Boston

Step 3

- **Apply MBTA Boarding Model to Estimate Corridor Boardings by Market and # of Trains**
- **Apply Downeaster Travel Time Elasticities to Adjust Boardings for Longer Travel Times**

The model was then applied to the average daily LBS trips to Boston from the communities in the station catchment areas outside of the MBTA service area. In the final step, the volume of intra-corridor trips was estimated by comparing each Northern Tier service alternative with the volume of intrazonal travel between comparable stations on the Amtrak Downeaster.[14] Forecasted ridership ranges were developed for each alternative, displayed as low and high ends of the range. The resulting estimates for each service alternative are presented in Table 4.2.

Table 4.2: Phase 1 Alternatives Average Annual Daily Boardings

Alternative	**Station**	**Average Annual Boardings**	
		Low End	**High-End**
1 – Lower Investment	NORTH ADAMS	220	440
	GREENFIELD	2,420	6,600
	FITCHBURG	18,480	48,730
	BOSTON	19,200	50,700
Totals		**40,320**	**106,470**
2 – Higher Investment	NORTH ADAMS	1,430	4,180
	GREENFIELD	7,370	20,350
	FITCHBURG	21,120	55,330
	BOSTON	27,200	72,600
Totals		**57,120**	**152,460**

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[14] The volume of intra-corridor trips refers to those not having an origin or destination in Boston.

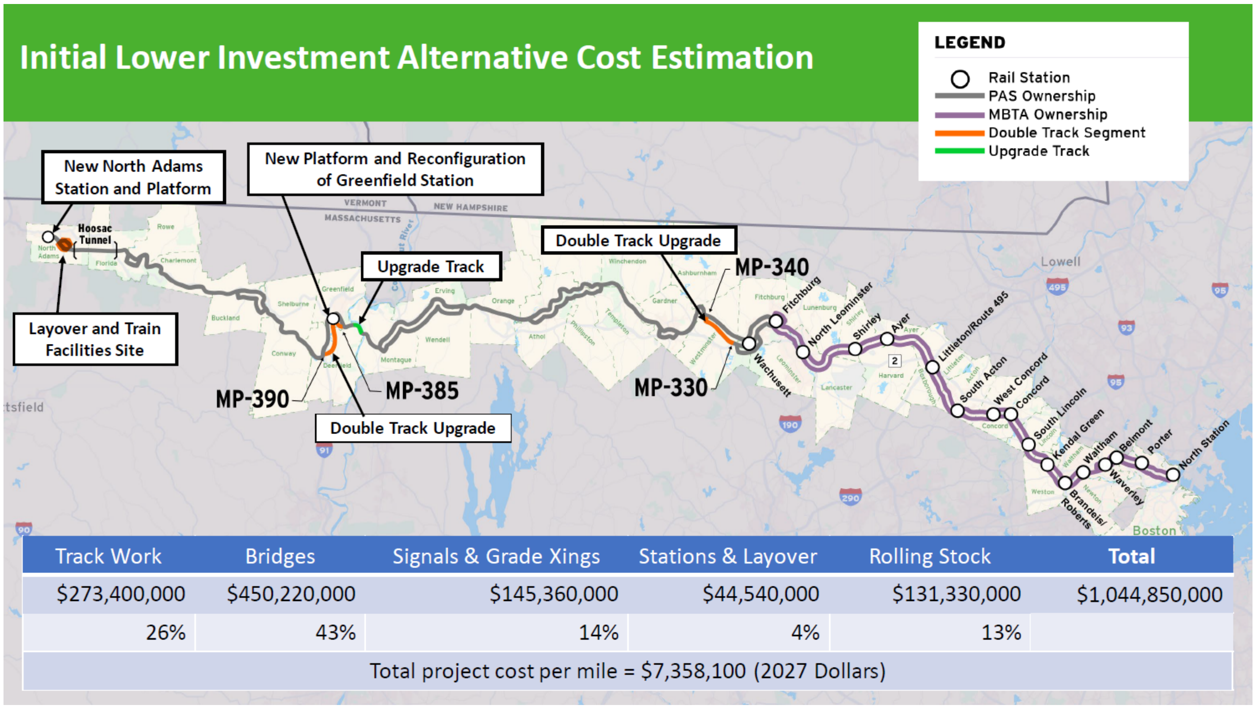
Estimation of Construction and Operating Costs

Two types of costs are estimated for each alternative: capital, and operations and maintenance. The capital cost estimate includes the design, construction, and property acquisition for the new and modified infrastructure required to provide the service under each alternative. The operations and maintenance cost estimate is the annual cost of providing the service.

Capital (or construction) cost estimates consider the materials, location, equipment, and labor needed for the proposed service. The level of certainty and accuracy of a construction cost estimate is impacted by the level of design. An Order of Magnitude Estimate was used at this stage of conceptual planning to evaluate the feasibility of each service alternative. The estimation process builds in contingency costs to account for the unknown elements of the project to reduce the level of uncertainty at this feasibility stage. As more about the existing site conditions and proposed design is known, the amount of contingency in the estimate is decreased.

Construction cost estimates are based on material, equipment, and labor costs from recent railroad construction projects in Massachusetts and surrounding states. Level 1 construction cost estimates were relied upon, which represent the overall order of magnitude costs and incorporate significant contingency costs to account for unknown but expected costs for construction. Construction costs for Alternatives 1 and 2 are shown below in Figure 4.6 and Figure 4.7. 2027 costs were used as that was the earliest possible mid-point of construction for the project. mid-point of construction is a typical point for estimating total project costs.

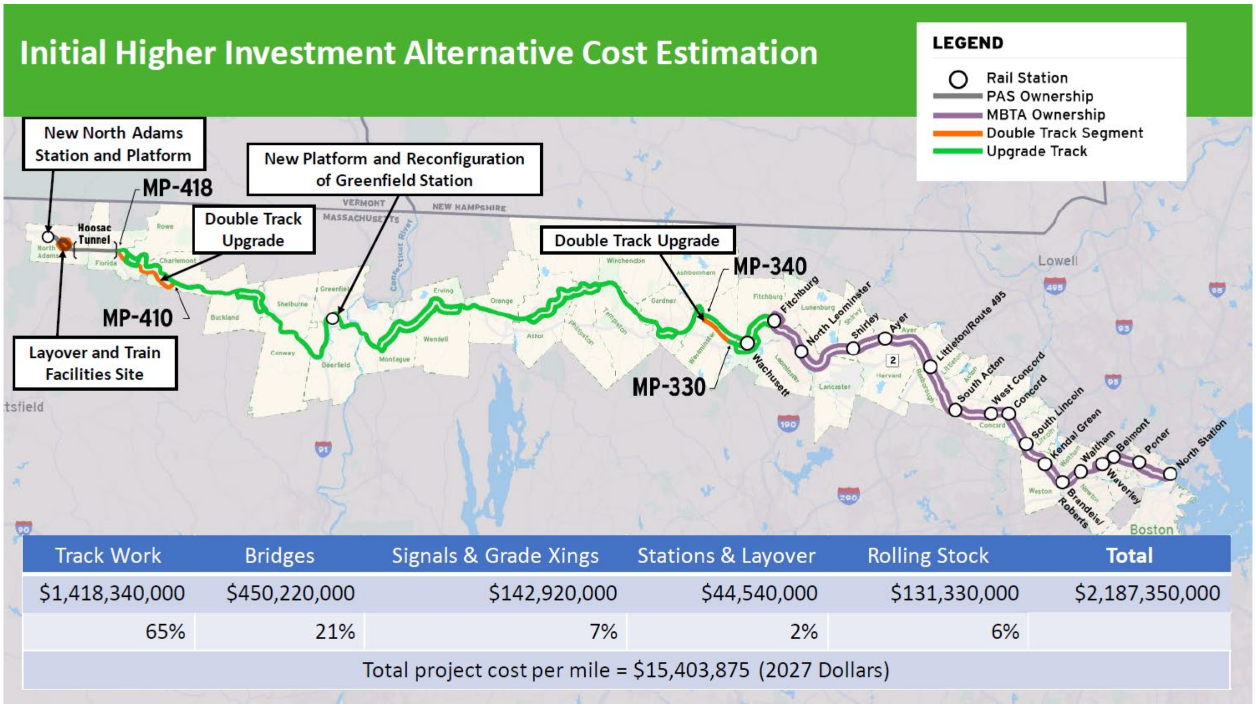
Figure 4.6: Map of Estimated Construction Costs for Alternative 1



Track Work	Bridges	Signals & Grade Xings	Stations & Layover	Rolling Stock	Total
$273,400,000	$450,220,000	$145,360,000	$44,540,000	$131,330,000	$1,044,850,000
26%	43%	14%	4%	13%	

Total project cost per mile = $7,358,100 (2027 Dollars)

Figure 4.7: Map of Estimated Construction Costs for Alternative 2



Track Work	Bridges	Signals & Grade Xings	Stations & Layover	Rolling Stock	Total
$1,418,340,000	$450,220,000	$142,920,000	$44,540,000	$131,330,000	$2,187,350,000
65%	21%	7%	2%	6%	
Total project cost per mile = $15,403,875 (2027 Dollars)					

These construction cost estimates illustrate the magnitude of investment required to improve a serviceable freight right-of-way for passenger rail service, along with the necessary facilities.

Estimates of the cost to operate the service and to maintain the fixed infrastructure and the rolling stock are developed using cost data from other comparable intercity services. These costs include operations staff, vehicle maintenance, facility maintenance, fuels, track maintenance, and administration and support.

Mobility and Access

Each of the Phase 1 alternatives provided similar access benefits by having the same stations and daily train frequency. For residents west of the MBTA Commuter Rail service area, the two initial alternatives provide a new mode of travel that increases mobility options and improves connectivity and access to destinations. With five trains per day, there is sufficient frequency for travelers to plan both work-based and non-work-based trips, such as healthcare-related travel and leisure travel.

The primary difference between the two initial service alternatives is the overall travel time between stations. The lower investment alternative would provide a 3-hour, 55-minute travel time from North Adams to Boston, whereas the higher investment alternative would provide a 2-hour, 48-minute travel time from North Adams to Boston, a travel time that is competitive with driving by personal vehicle during peak travel times. The benefits of the shorter travel time are illustrated in the higher annual ridership numbers from each station on the higher investment scenario.

Economic Impact

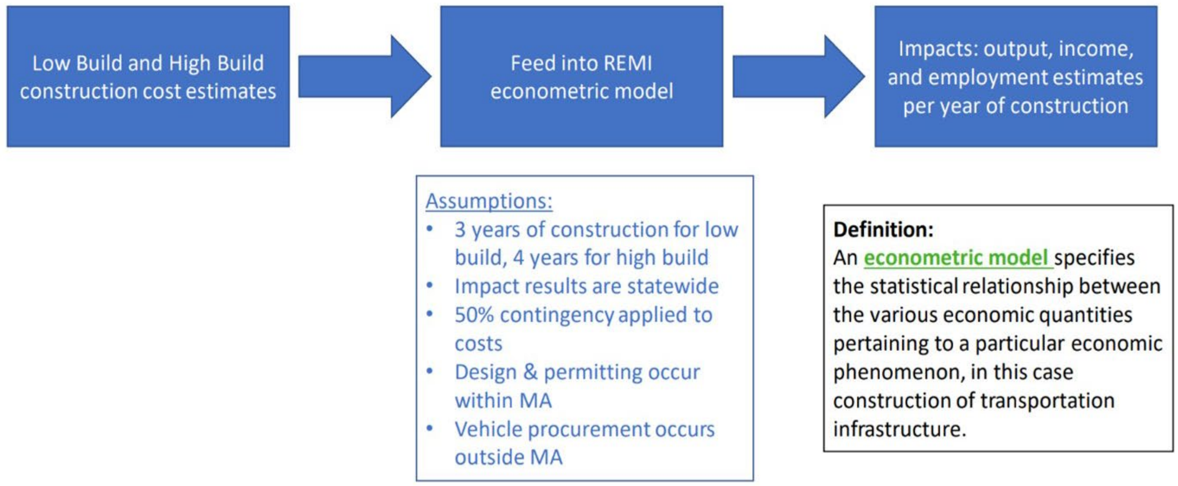
Construction and operating costs are used to develop metrics for several evaluation criteria, including economic impact. Construction cost impacts were analyzed using the econometric

REMI Model.[15] The costs for each service alternative were input into the model, and the model then produced output, income, and employment estimates per year of construction:

- Output represents the total value of goods, services, and income that could result from the construction work;
- Income is derived from the anticipated resultant sales and employment; and
- Employment calculates the total of the three types of jobs created by the construction: direct, indirect, and induced.

While direct employment consists of the construction itself, indirect employment is the result of jobs that support the construction, such as supply related positions. Induced jobs are those that may result from the presence of those working on or supplying the project work who are spending in the local economy. For example, an increase in workers visiting a particular coffee shop in the construction area could result in the hiring of a new employee at the coffee shop.

Figure 4.8: Calculation Process for Primary Construction Impacts


Low Build and High Build construction cost estimates
Feed into REMI econometric model
Impacts: output, income, and employment estimates per year of construction

Assumptions:
- 3 years of construction for low build, 4 years for high build
- Impact results are statewide
- 50% contingency applied to costs
- Design & permitting occur within MA
- Vehicle procurement occurs outside MA

Definition:
An econometric model specifies the statistical relationship between the various economic quantities pertaining to a particular economic phenomenon, in this case construction of transportation infrastructure.

For the calculations, a three-year construction duration for Alternative 1 and a four-year duration for Alternative 2 was assumed.[16] Additionally, it was assumed the economic impacts occur statewide; the design and permitting occur within Massachusetts; and the procurement of vehicles occurs outside of Massachusetts.

The Output represents the total value of goods/services/income that result from the construction work.
Income is derived from resultant sales and employment. Employment represents the total of the three types of jobs created by the construction – direct (performing construction), indirect (supporting construction), and induced (developed as a result of the construction).

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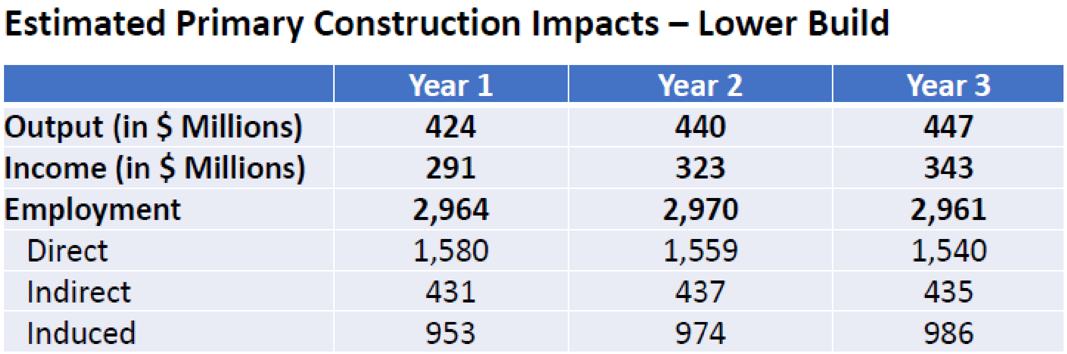
[15] An econometric model specifies the statistical relationship between the various economic quantities pertaining to a particular economic phenomenon, in this case, the construction costs of transportation infrastructure.

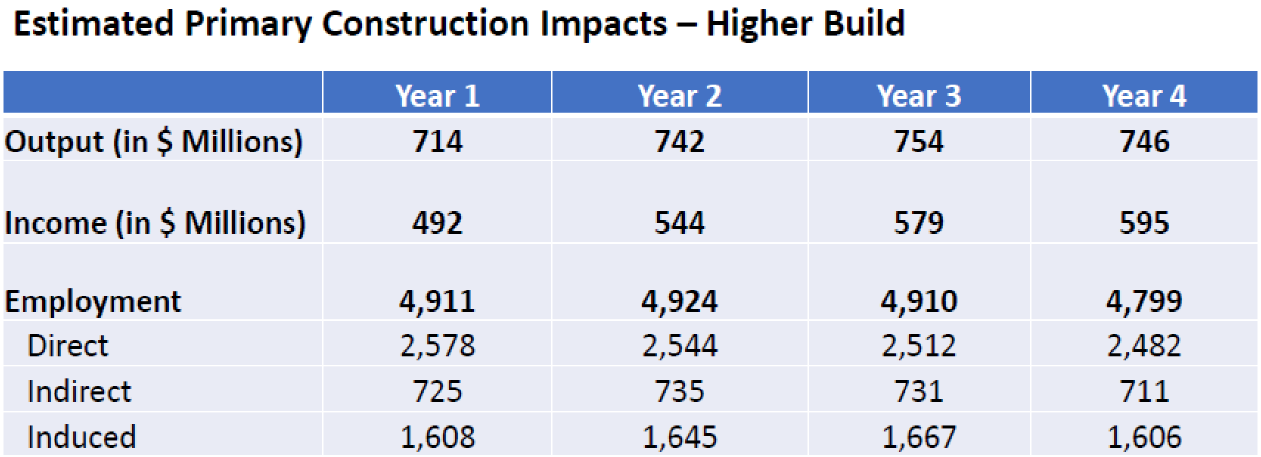
[16] Alternative 1's three-year construction duration is due to the smaller scale of infrastructure modifications.

Table 4.3: Estimated Primary Construction Impacts



Estimated Primary Construction Impacts – Lower Build

	Year 1	Year 2	Year 3
Output (in $ Millions)	**424**	**440**	**447**
Income (in $ Millions)	**291**	**323**	**343**
Employment	**2,964**	**2,970**	**2,961**
Direct	1,580	1,559	1,540
Indirect	431	437	435
Induced	953	974	986



Estimated Primary Construction Impacts – Higher Build

	Year 1	Year 2	Year 3	Year 4
Output (in $ Millions)	**714**	**742**	**754**	**746**
Income (in $ Millions)	**492**	**544**	**579**	**595**
Employment	**4,911**	**4,924**	**4,910**	**4,799**
Direct	2,578	2,544	2,512	2,482
Indirect	725	735	731	711
Induced	1,608	1,645	1,667	1,606

Social Equity and Fairness

Social equity and fairness were evaluated by assessing zero-car households and Environmental Justice (EJ) communities across the corridor. The rail service may be a new travel option for zero-car households around Greenfield, North Adams, and other communities with access to stations. The maps below show access for zero-car households and EJ communities.

Figure 4.9: Map of Zero-Car Households in the Northern Tier Corridor

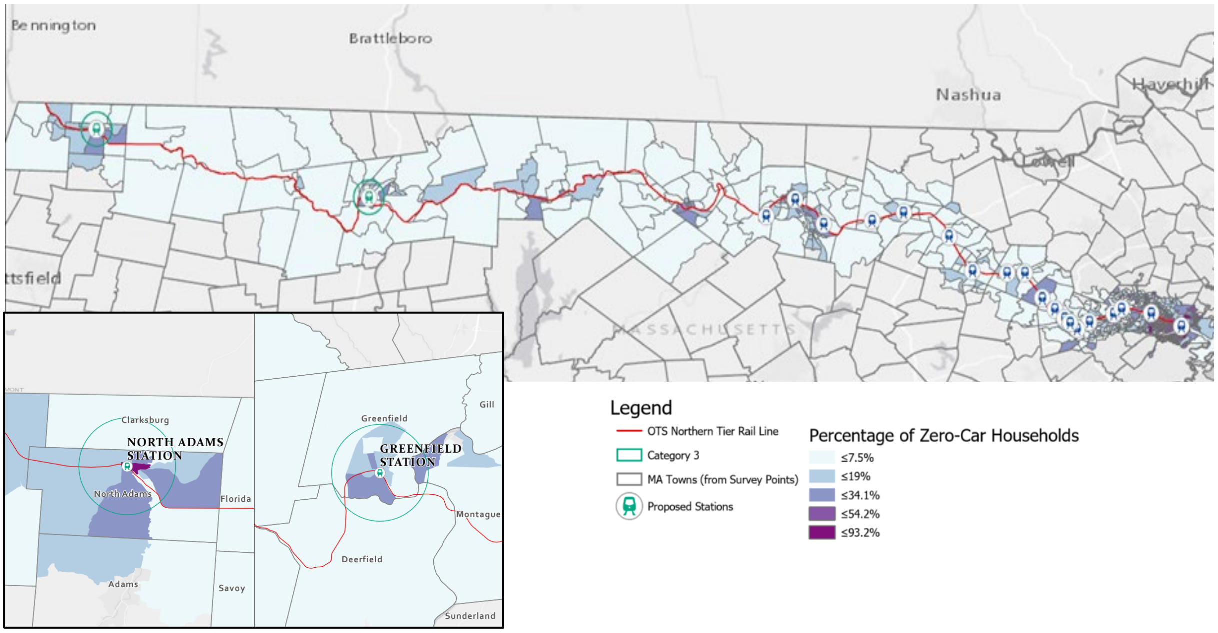
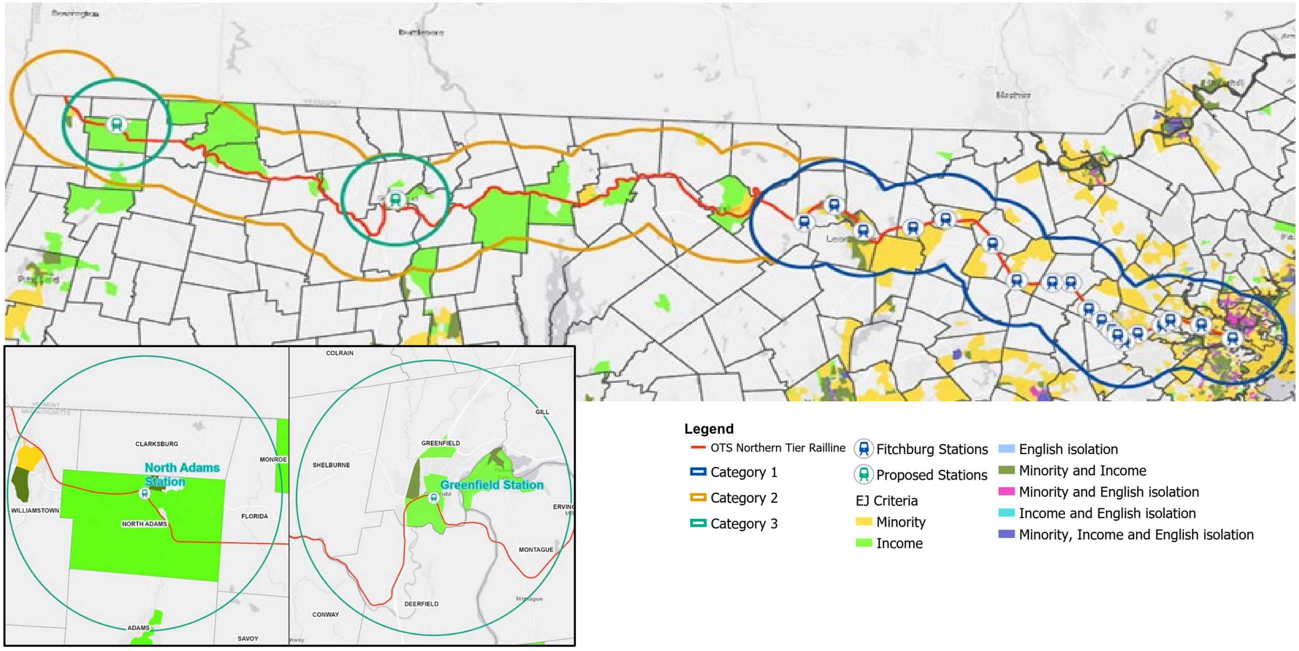


Figure 4.10: Map of Environmental Justice Communities in the Northern Tier Corridor



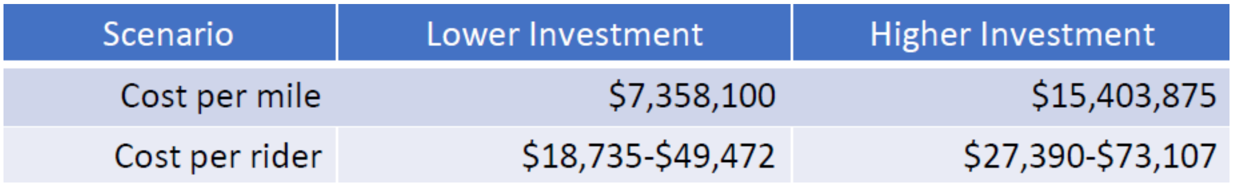
Impacts on Rail Capacity

A key factor in evaluation of the service alternatives is the potential for impacts on the Commonwealth's rail capacity. These impacts were accounted for in the RTC modeling process. Train schedules were developed to work with the current MBTA Commuter Rail service schedule. Current passenger and freight trains were incorporated into the model and produced minimal impacts on each.

Cost Effectiveness

Passenger rail service can also be evaluated for cost effectiveness. Such metrics include the construction cost per mile and per rider. The construction cost per mile is calculated by dividing the total project cost by the length of the project. Similarly, the cost per rider is total project cost divided by the total number of riders.

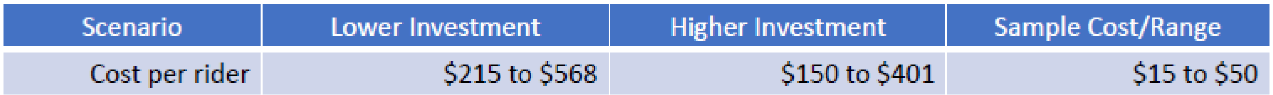
Figure 4.11: Capital Cost Effectiveness Metrics for the Initial Service Alternatives



Scenario	Lower Investment	Higher Investment
Cost per mile	$7,358,100	$15,403,875
Cost per rider	$18,735-$49,472	$27,390-$73,107

Similar measures can be used to evaluate the cost effectiveness of the proposed service. The annual cost of operations and maintenance (O&M) per rider are shown in the table below for each alternative.

Figure 4.12: Operations and Maintenance Cost Effectiveness Metrics for the Initial Service Alternatives



Scenario	Lower Investment	Higher Investment	Sample Cost/Range
Cost per rider	$215 to $568	$150 to $401	$15 to $50

Estimated ridership is a key factor in the cost difference between the lower and higher investment alternatives. For comparison, a sample range of costs is included for comparable services such as the Pere Marquette (IL-WI), the Downeaster (ME-MA), and the Vermonter (D.C.-VT).

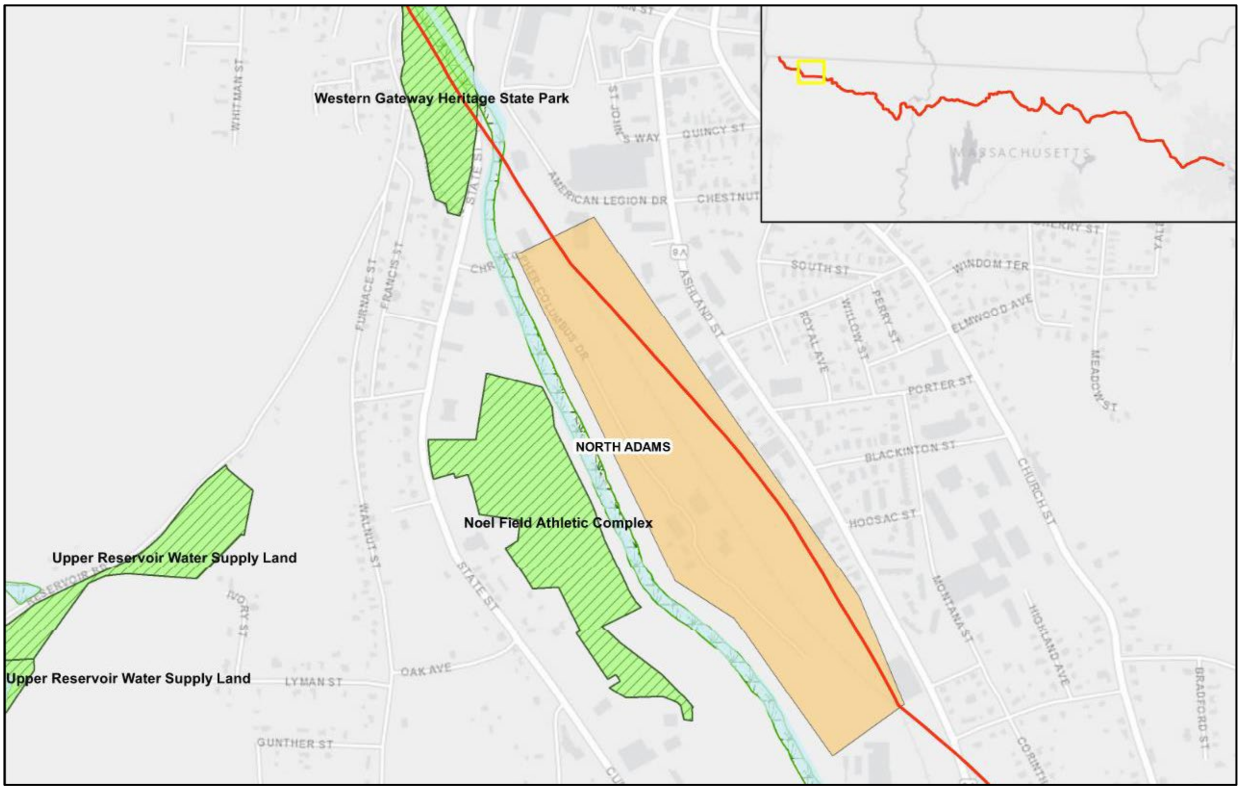
Environmental and Cultural Resources

A wide array of environmental and cultural resources were inventoried and mapped, including wetlands and waterways; FEMA designated floodplains; designated open space and recreational parklands; National Register listed historic districts and properties; state designated Areas of Critical Environmental Concern (ACEC); and 2020 EJ Census block groups.

Existing environmental constraints within and adjacent to the corridor were identified using MassMapper, FEMA Flood Insurance Rate Maps (FIRMs), the Massachusetts Cultural Resource Information System (MACRIS), and the U.S. Environmental Protection Agency (U.S. EPA) Environmental Justice (EJ) Screen. An extensive list of permits that may be required, funding sources, the proximity of the work to protected resources, and other factors was compiled. The service alternatives use existing right-of-way, which may limit environmental impacts.

The potential impact of a possible layover yard and facility in North Adams on a site outside of the existing right-of-way and adjacent to the Hoosic River would require future assessment.

Figure 4.13: Potential Location of North Adams Layover Yard and Facility



Safety and Air Quality

Measures to evaluate safety and air quality were developed based on estimated ridership, as new passengers could result in fewer cars on the road, lower emissions of pollution and greenhouse gases, and increased safety with fewer cars and less congestion on roadways. A decrease in vehicular travel could lead to a net reduction in traffic congestion and less idling could mean fewer emissions.

Figure 4.14: Estimated Environmental Benefits for the Initial Service Alternatives

Scenario	Lower Investment	Higher Investment
Annual VMT Reduction	-2,313,821 to -6,105,127	-3,754,257 to -10,128,225
% of Route 2 VMT	0.10% to 0.27%	0.17% to 0.46%

Phase 2 Alternatives

The Phase 1 service alternatives and the evaluation results were presented at a public workshop in January of 2023. Following an overview of the study process, the public workshop featured three modules:

- Module 1: Alternatives Development Approach and Methods
- Module 2: Evaluation of Phase 1 Alternatives
- Module 3: Looking Ahead of Phase 2

Each module included a presentation followed by discussion and questions and answers. Poll questions were used to engage workshop attendees about potential trip purposes, service benefits, and service characteristics. Tradeoffs related to the potential characteristics of the four additional service alternatives to be developed as part of Phase 2 were also discussed, including stations, coverage area, service structure, frequency of service, span of service, travel time between stations, and physical improvements.

During and following the public workshop, Working Group members and other stakeholders provided feedback on the Phase 1 alternatives and input on the desired characteristics for potential inclusion in the development of the Phase 2 service alternatives. This feedback advocated for considering additional station stops in communities across the corridor (e.g., Shelburne Falls, Athol, Orange, Gardner, and Porter Square); evaluating a connection to Albany, NY; considering potential upgrades to support higher speeds, including the electrification of the passenger rail service and considering seasonal stops.[17]

The characteristics of the Phase 2 alternatives were developed based on the comments and questions received.

Overview of Phase 2 Alternatives

With Alternative 2 used as a base for the four additional service alternatives, the Phase 2 service alternatives each provide five round-trips, seven days per week. Each alternative provides service using coaches comparable to those used on the Valley Flyer service. The schedule times for the trains in each alternative are also similar, with one morning peak train, two midday trains, one evening peak train, and one evening train: from Boston North Station – two off-peak trains, one evening peak train, one evening train, one late evening train. All alternatives use diesel locomotives except for Alternative 3, which uses electrified locomotives.

Alternative 3: Electrified Service

Alternative 3 would provide a one-seat ride using electrified locomotives with the same type of coaches used in Alternatives 1 and 2 and includes electrification of the right-of-way between Fitchburg and North Adams with overhead catenary system and associated power substations. The service alternative assumes that electrification from Fitchburg east would be completed by the MBTA as part of a broader plan to electrify Commuter Rail service in Eastern Massachusetts. Alternative 3 would include North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter, and North Station as station stops.

Other infrastructure improvements would include new double track in Charlemont, upgrades of the track from Class 3 to Class 4, crossing renewals, bridge rehabilitation, signal replacement and Positive Train Control, new stations and platforms in North Adams and Athol, a new platform and reconfiguration of Greenfield Station, and a layover and train facilities site in North Adams. Specific sites for power substations have not been identified.

These improvements would support an increase in track class to fully use capability of the train to optimize speed through curves, along with some trackage additions to support capacity improvements. Travel time from North Adams to Boston would be 2 hours and 50 minutes.
The added station stops would allow for more travel within the corridor and serve major job centers such as Devens (via Ayer Station) and Kendall Square in Cambridge (via MBTA Red Line service from Porter Station). The maximum operating speeds in this alternative would be 60 mph in the PAS territory and 80 mph in the MBTA territory, similar to the Higher Investment Scenario

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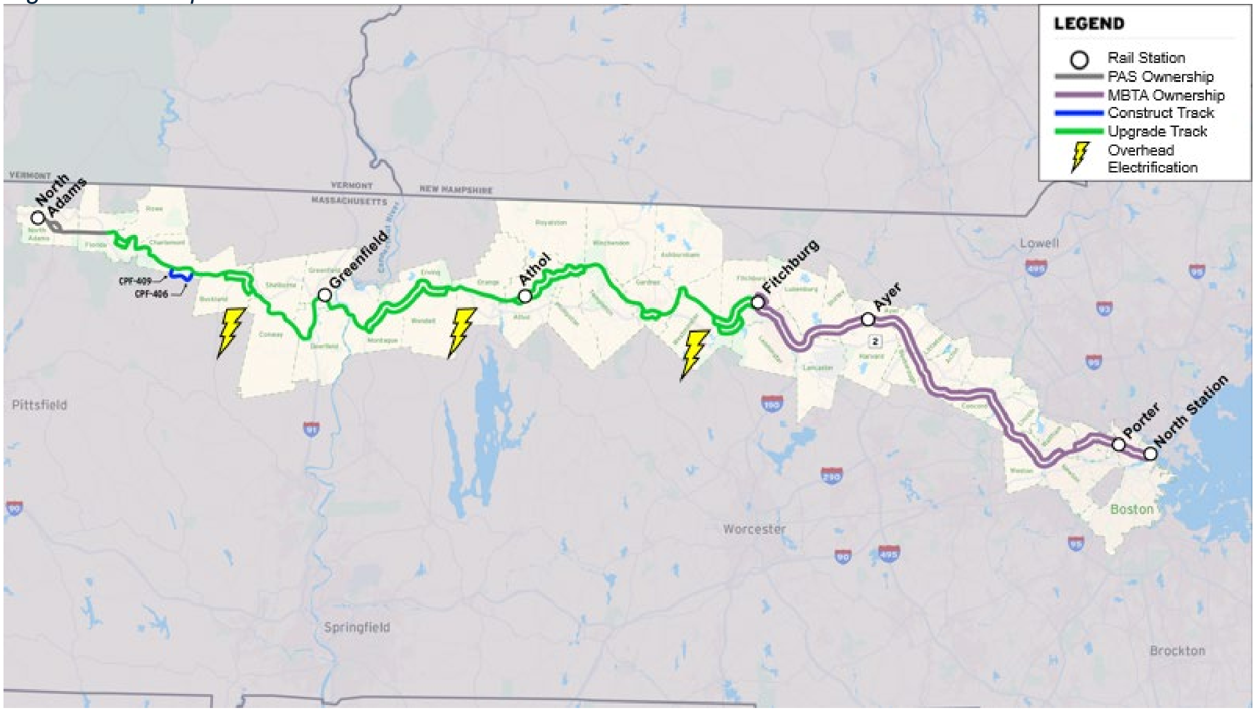
[17] Seasonal stops are added to the schedule to support seasonal attractors (e.g., weekend stops at Wachusett during the ski season.

developed in Phase 1. The electrification of the system allows for more efficient acceleration from and deceleration to stations, which produces a travel time similar to Alternative 2 even with three more station stops. These benefits are achieved with a significant cost above Alternative 2, with a difference of $1,355,397,655.

Figure 4.15: Map of Alternative 3 - Electrified Service



Alternative 4: Full Local Service

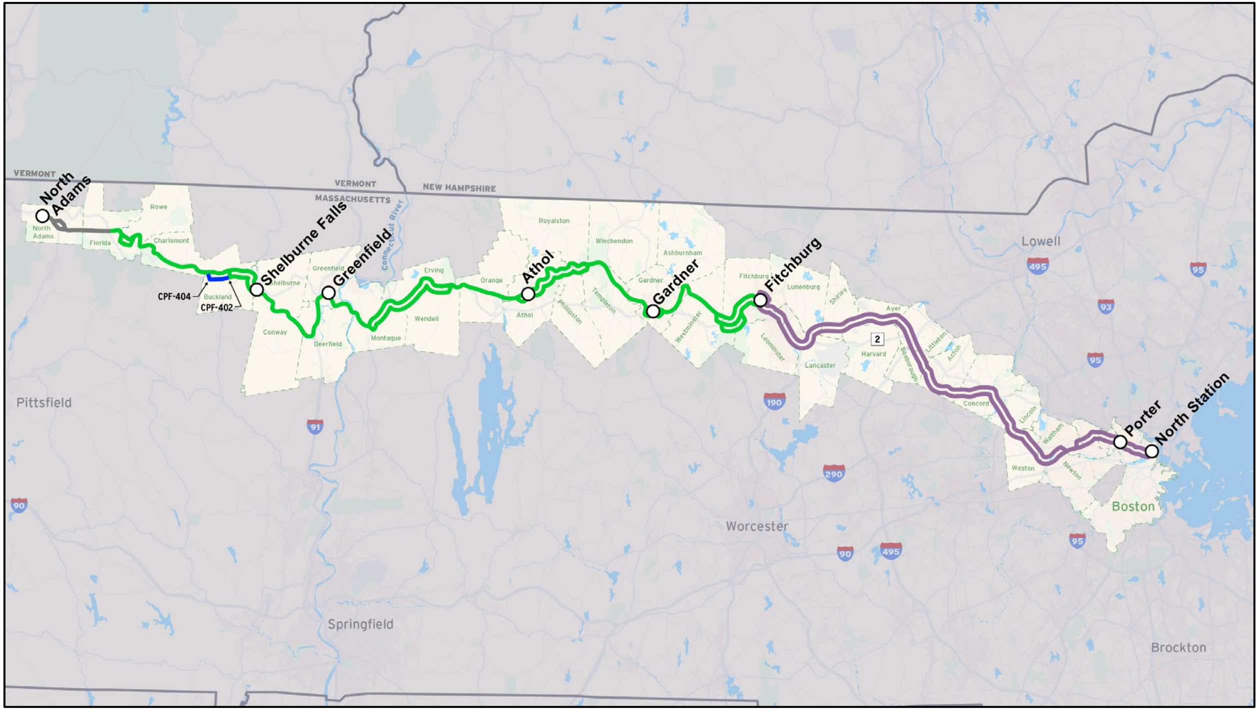
Alternative 4 would provide a one-seat ride. Infrastructure improvements would be comparable to those in Alternative 2, track rehabilitation and improvements to support an increase in track class to fully use capability of the train to optimize speed through curves, along with some trackage additions to support capacity improvements, including double track at Buckland. This alternative would add stops at Shelburne Falls, Athol, Gardner, and Porter Square. Travel time from North Adams to Boston would be 2 hours and 59 minutes.

The added station stops were selected to allow more travel within the corridor and serve the major job center at Kendall Square in Cambridge (via MBTA Red Line service from Porter Station). The maximum operating speeds in this alternative would be the same as the Higher Investment alternative developed in Phase 1.

Other infrastructure improvements would include new double track in Charlemont, upgrades of the track from Class 3 to Class 4, crossing renewals, bridge rehabilitation, signal replacement and Positive Train Control, new stations and platforms in North Adams and Athol, a new platform and reconfiguration of Greenfield Station, and a layover and train facilities site in North Adams.

These improvements would support an increase in track class to fully use capability of the train to optimize speed through curves, along with some trackage additions to support capacity improvements. Travel time from North Adams to Boston would be 2 hours and 50 minutes.

Figure 4.16: Map of Alternative 4 - Full Local Service

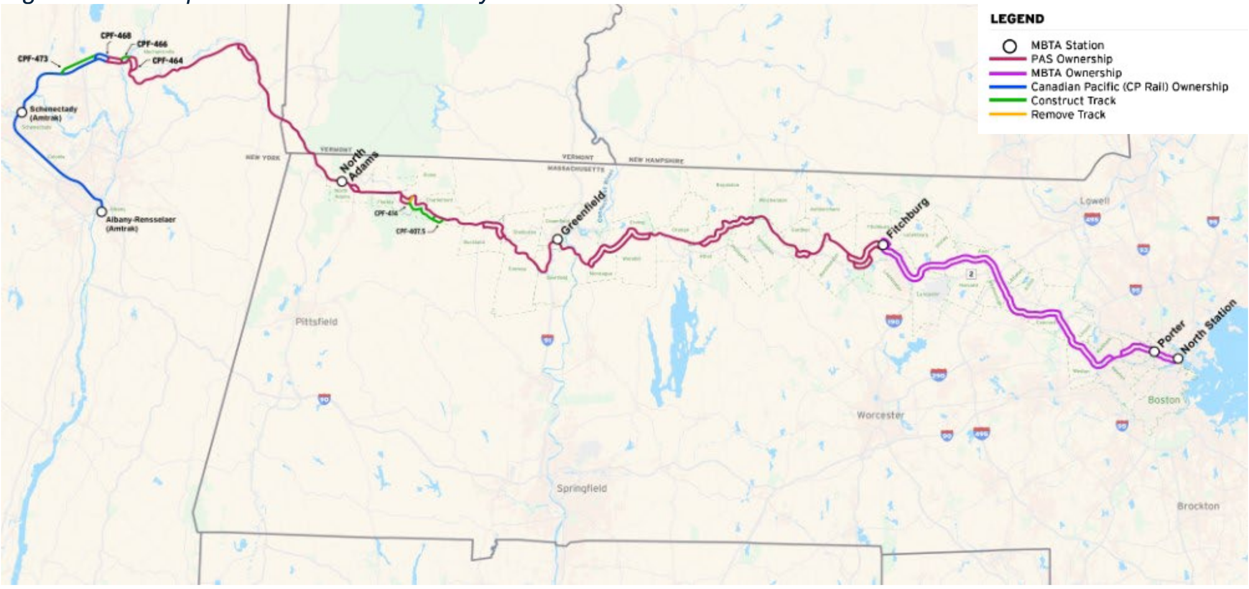


Alternative 5: Albany Extension

Alternative 5 would provide a one-seat ride. Infrastructure improvements would be comparable to those in Alternative 2: track rehabilitation and improvements to support an increase in track class to fully use capability of the train to optimize speed through curves, along with some trackage additions to support capacity improvements. Limited track additions are assumed for New York State, including Stillwater, Mechanicville, and Clifton Park. Instead of starting at North Adams, this alternative would run from Albany, New York, to Boston North Station. It would also include stops at North Adams, Greenfield, Fitchburg, and Porter. The schedule would be optimized to allow transfers to other passenger rail services at the Albany/Rensselaer and Greenfield Stations. Travel time from North Adams to Boston would be 2 hours and 49 minutes. Travel time from Albany, New York, to Boston North Station would be 4 hours and 34 minutes.

The schedule is optimized to allow transfers to other passenger rail services at the Albany/Rensselaer and Greenfield stations. The maximum operating speeds in this alternative would be the same as the Higher Investment Scenario developed in Phase A from North Adams to Boston North Station. No improvement in operating speeds will be included between North Adams and Albany, NY. Equipment for this service would layover at the existing Amtrak facility in Rensselaer, NY. Unlike the other alternatives, no facility would need to be constructed in North Adams.

Figure 4.17: Map of Alternative 5 - Albany Extension

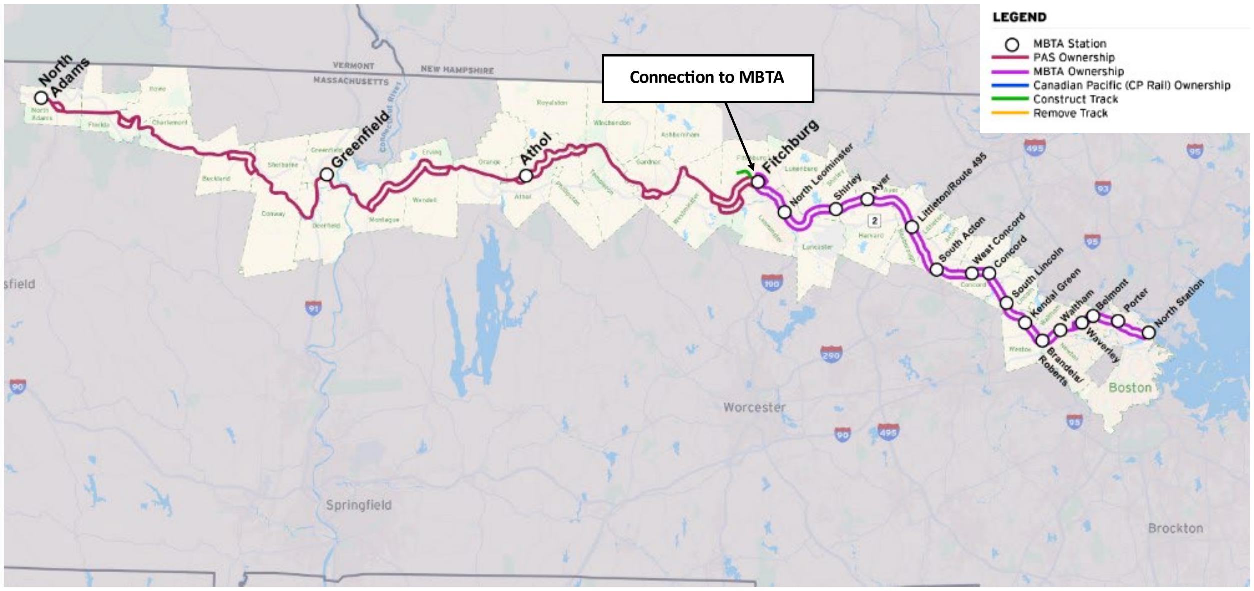


Alternative 6: Northern Tier Rail Link

Alternative 6 is a two-seat ride with a connection between Northern Tier trains and MBTA Commuter Rail Trains at Fitchburg. Infrastructure improvements would be comparable to those in Alternative 2 track rehabilitation and improvements to support an increase in track class to fully use capability of the train to optimize speed through curves, along with some trackage additions to support capacity improvements. This alternative would add stops at Athol and Fitchburg and make all scheduled MBTA stops between Fitchburg and Boston. This service alternative would provide daily service between North Adams and Fitchburg Station where passengers could transfer to the MBTA Commuter Rail service for destinations further east. Travel time from North Adams to Boston would be 3 hours and 22 minutes.

This service alternative provides service daily between North Adams and Fitchburg Station, where passengers could transfer to the MBTA Fitchburg Commuter Rail service for destinations farther east. The operating speeds in this alternative would be the same as the Higher Investment Scenario developed in Phase 1.

Figure 4.18: Map of Alternative 6 - Northern Tier Rail Link



A comparison of the Phase 2 service alternatives is included in Table 4.4.

Table 4.4: Features of Phase 2 Alternatives

Assumptions	**Electrified Service**	**Full Local Service**	**Albany Extension or Albany Connector**	**Northern Tier Rail Link**
Service Type	One-seat ride from North Adams to Porter Square, Boston North Station	One-seat ride from North Adams to Porter Square, Boston North Station	One-seat ride from Albany to North Adams to Porter Square, Boston North Station	Two-seat ride from North Adams, Greenfield, Fitchburg to Porter Square, Boston North Station
Number of Stations	7 -North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter Square, North Station	8 - North Adams, Shelburne Falls, Greenfield, Athol, Gardner, Fitchburg, Porter Square, North Station	6 - Albany (NY), North Adams, Greenfield, Fitchburg, Porter Square, North Station	4 - North Adams, Greenfield, Athol, Fitchburg, (Connection to MBTA making scheduled station stops)
Dwell Time at Stations	2 minutes	2 minutes	2 minutes	2 minutes Northern Tier 30 seconds at MBTA stations

Layover Yard - Facility	North Adams	North Adams	Albany	North Adams
Track Infrastructure Improvements	Higher investment baseline with new trackage additions to support meet- pass locations. Electrification infrastructure additions.	Higher investment baseline with new trackage additions to support meet-pass locations.		
Equipment Type	Electric locomotive with Amfleet passenger cars and same consists as Valley Flyer	Diesel locomotive with Amfleet passenger cars and same consist as Valley Flyer		
MBTA Infrastructure	No modification to MBTA infrastructure			
Frequency	5 trains daily (1 AM peak, 2 midday, 1 PM peak, 1 evening)			
Schedule Times	Schedule times selected for trip purposes; secondary bias toward connection with North-South Service at Greenfield			
Other uses of ROW	Assumes commuter schedules and freight trains			

Evaluation of Phase 2 Alternatives and Refinements of Analysis

Refinement is a critical component of the study process. Based on comments and questions from the Working Group and the public, clarifications, and updates to the assumptions for ridership forecasting, cost estimation, and other elements were made.

The refinements to the Phase 1 alternatives and the Phase 2 alternatives development and evaluation were presented at Working Group and public meetings held in October of 2023.

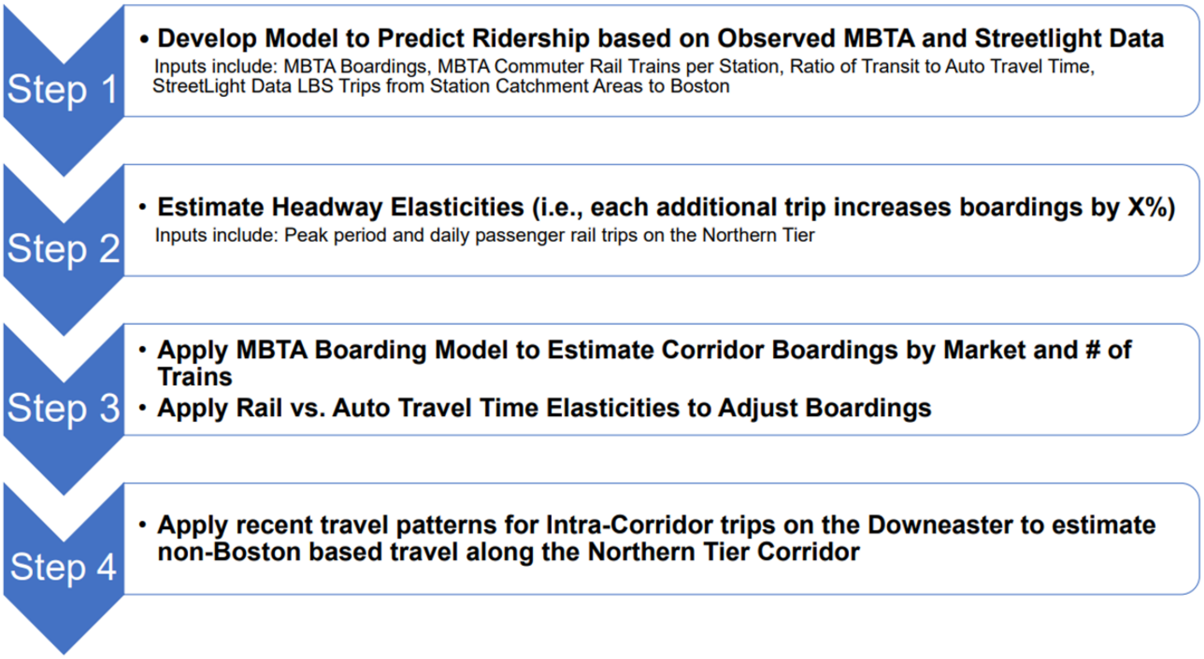
Refined Ridership Methodology and Results

Ridership is one measurement of the effectiveness of the service alternatives. A revised passenger rail boarding model was developed which, like the previous model, first estimates the number of boardings at each station along the proposed route using linear regression. The number of daily boardings at each station are estimated based on the average daily LBS trips and the ratio of transit-to-auto travel time to Boston. For this revised approach, each station’s rail and auto travel-time ratio was used in the estimation process. As the Northern Tier service alternatives run fewer daily trains than the MBTA Commuter Rail, the effect of service frequency on the number of boardings was accounted for by adjusting the modeled boardings based on headway elasticity.

The model was then applied to the average daily LBS trips to Boston from the communities in the station catchment areas outside of the MBTA service area. For the revised approach, the ratio of rail travel times for the Amtrak Lake Shore Limited service to auto travel times was used in place of the MBTA-related values used in the first part of the modeling process. This resulted in a set of high and low values for ridership between the station catchment areas and Boston. In the final step, the volume of intra-corridor trips was estimated by comparing each Northern Tier service alternative to the volume of intrazonal travel between comparable station on the Amtrak Downeaster.[18] Forecasted ridership ranges were developed for each alternative, displayed as low and high ends of the range. The resulting estimates for each service alternative are presented in Table 4.5.

Each of the six alternatives has high- and low-end forecasts. The low and high ends of the ranges for Electrified Alternative (Alternative 3) and Full Local Alternative (Alternative 4) represent the highest ridership numbers while the estimates for Alternative 6 have the lowest volume projections, indicating that combinations of competitive trip times and expanded station access produce the best ridership results for this corridor.

Figure 4.19: Updated Ridership Estimation Process



- **Develop Model to Predict Ridership based on Observed MBTA and Streetlight Data**
  Inputs include: MBTA Boardings, MBTA Commuter Rail Trains per Station, Ratio of Transit to Auto Travel Time, StreetLight Data LBS Trips from Station Catchment Areas to Boston
- **Estimate Headway Elasticities (i.e., each additional trip increases boardings by X%)**
  Inputs include: Peak period and daily passenger rail trips on the Northern Tier
- **Apply MBTA Boarding Model to Estimate Corridor Boardings by Market and # of Trains**
- **Apply Rail vs. Auto Travel Time Elasticities to Adjust Boardings**
- **Apply recent travel patterns for Intra-Corridor trips on the Downeaster to estimate non-Boston based travel along the Northern Tier Corridor**

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[18] The volume of intra-corridor trips refers to those not having an origin or destination in Boston.

Figure 4.20: Station Catchment Area for LBS Trips

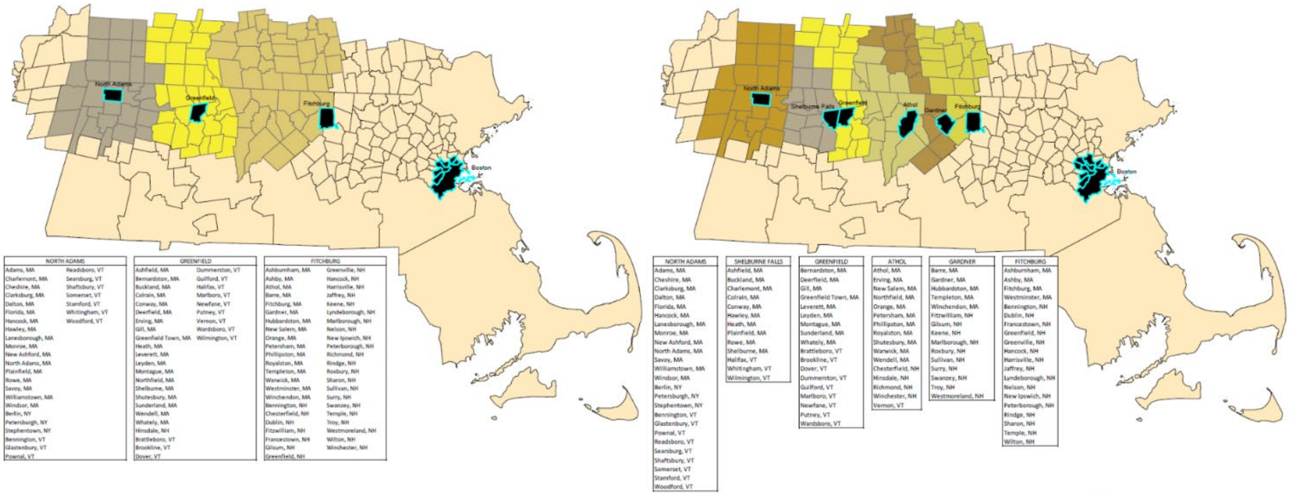


Table 4.5: Updated Phase 2 Alternatives Average Annual Daily Boardings

		Lower Bound	Average	Upper Bound	Range
1 – Lower Investment	**NORTH ADAMS**	590	860	1,130	590 - 1,130
	GREENFIELD	4,370	6,540	8,720	4,370 - 8,720
	FITCHBURG	29,710	39,260	48,810	29,710 - 48,810
	BOSTON	31,210	42,000	52,800	31,210 - 52,800
	TOTAL RIDERSHIP	65,880	88,660	111,460	**65,880 - 111,460**
2 – Higher Investment	**NORTH ADAMS**	9,730	10,690	11,660	9,730 - 11,660
	GREENFIELD	11,890	13,870	15,850	11,890 - 15,850
	FITCHBURG	31,430	40,960	50,500	31,430 - 50,500
	BOSTON	47,730	58,960	70,190	47,730 - 70,190
	TOTAL RIDERSHIP	100,780	124,480	148,200	**100,780 - 148,200**
3 – Electrified Service	**NORTH ADAMS**	9,390	10,420	11,440	9,390 - 11,440
	GREENFIELD	11,300	13,300	15,290	11,300 - 15,290
	ATHOL / ORANGE	14,310	17,130	19,940	14,310 - 19,940
	FITCHBURG	32,260	42,260	52,270	32,260 - 52,270
	AYER	36,170	48,680	61,180	36,170 - 61,180

	BOSTON	93,090	118,590	144,080	93,090 - 144,080
	TOTAL RIDERSHIP	196,520	250,380	304,200	**196,520 - 304,200**

4 – Full Local Service	**NORTH ADAMS**	6,640	7,270	7,920	6,640 - 7,920
	SHELBURNE FALLS	6,410	6,700	6,950	6,410 - 6,950
	GREENFIELD	10,440	12,530	14,620	10,440 - 14,620
	ATHOL / ORANGE	13,520	16,460	19,370	13,520 - 19,370
	GARDNER	19,840	27,260	34,660	19,840 - 34,660
	FITCHBURG	31,600	41,270	50,950	31,600 - 50,950
	BOSTON	79,590	100,290	120,990	79,590 - 120,990
	TOTAL RIDERSHIP	168,040	211,780	255,460	**168,040 - 255,460**
5 – Albany Extension	**ALBANY**	1,570	1,970	2,350	1,570 - 2,350
	NORTH ADAMS	8,550	9,270	9,980	8,550 - 9,980
	GREENFIELD	11,780	13,990	16,200	11,780 - 16,200
	FITCHBURG	30,920	40,460	49,980	30,920 - 49,980
	BOSTON	47,520	59,090	70,650	47,520 - 70,650
	TOTAL RIDERSHIP	100,340	124,780	149,160	**100,340 - 149,160**
6 – North Adams to Fitchburg With Transfer Between MBTA Commuter Rail and NT at Fitchburg	**NORTH ADAMS**	70	480	1,140	70 - 1,140
	GREENFIELD	310	2,190	4,090	310 - 4,090
	ATHOL / ORANGE	1,620	4,320	7,030	1,620 - 7,030
	FITCHBURG, Outbound	90	350	620	90 - 620

	Transfer from MBTA Commuter to NTPR at FITCHBURG	1,810	6,300	11,020	1,810 - 11,020
	TOTAL RIDERSHIP	3,900	13,640	23,900	**3,900 - 23,900**

Comparison with other Intercity Corridors

With annual ridership in the range of 65,000 to 304,000 (excluding Alternative 6), projected volumes are at the low end of currently operational regional intercity rail services in the United States. Table 4.6 below offers a comparison with select regional services in New England and the Midwest across key metrics – route length, population, frequency, and ridership. Federal fiscal year 2023 ridership is included, which though not fully recovered from the COVID-19 on most routes, is approaching fiscal year 2019 levels. All of the routes listed are experiencing upward trends in ridership and most will likely close any remaining gap with fiscal year 2019 ridership in fiscal year 2024.

Table 4.6: Characteristics of Select Regional Intercity Services

Service	Route Length *(miles)*	Population within 25 miles of Service Area *(millions)*[i]	Frequency (Daily round trips)	Fiscal Year 2023 Ridership[ii]
Amtrak *Downeaster* Boston-Portland-Brunswick	145	5.6	5	542,639
Amtrak *Ethan Allen* New York – Albany – Burlington, VT	309	18.3	1	86,638
Amtrak Chicago-Quincy, IL	258	8.0	2	114,521[iii]
Amtrak Chicago-Carbondale, IL	310	7.4	2	270,017

Notes:

[ii]2020 population estimates, as reported in https://www.railpassengers.org/resources/ridership-statistics/

[ii]Amtrak Federal FY 2023 ridership statistics.https://media.amtrak.com/wp-content/uploads/2023/11/Copy-of-FY23-Year-End-Ridership.pdf. Ridership figures exclude trips exclusively on the Northeast Corridor.

[iii]Chicago-Quincy service experienced multiple interruptions in FY 2023, including partial substitution with buses November 2022 - January 2023. Prior to the COVID-19 pandemic, this service handled in excess of 200,000 passengers annually.

Refined Estimation of Construction and Operating Costs and Results

Total project costs including environmental permitting, design/engineering, construction and right of way costs were developed in the same way as for the initial alternatives, using costs from recent, comparable projects. The final analysis was updated to reflect changes in unit prices, where the largest change was lower costs for the purchase of vehicles. Similar to the first set of estimates, these estimates include escalation for engineering and construction in future years and contingency estimates to account for foreseeable costs that will emerge as design progresses. Operations and maintenance costs were estimated using the costs of similar services. Construction costs for Alternatives 1 - 6 are shown below in the following maps.

Figure 4.21: Capital Cost Categories

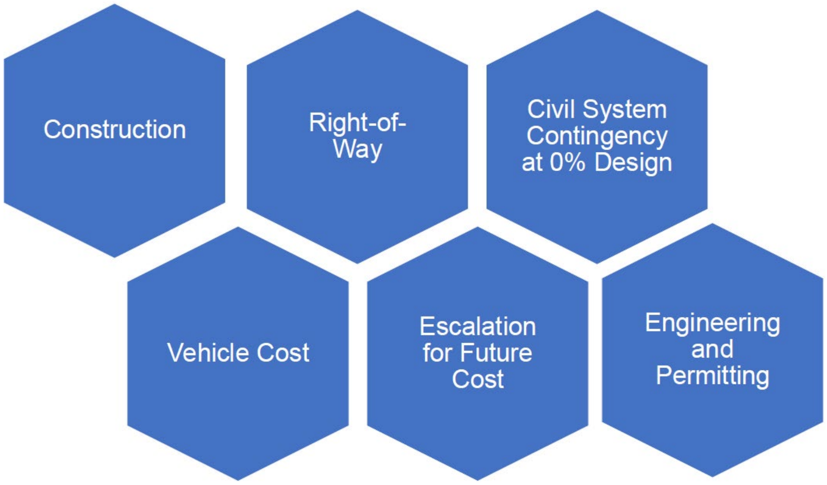
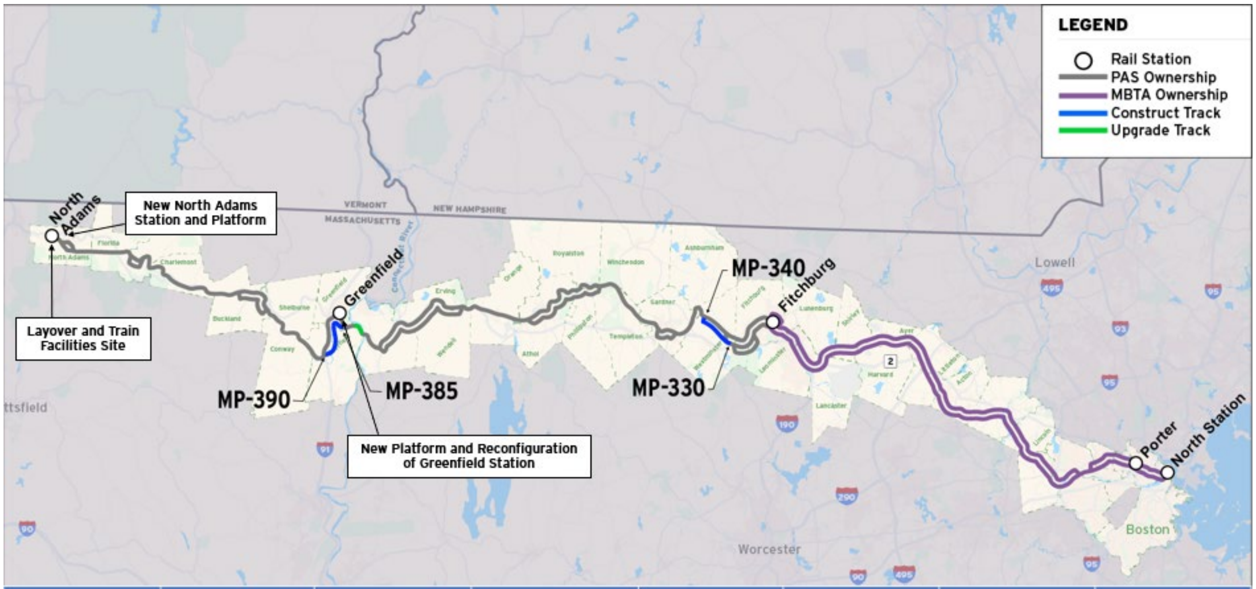
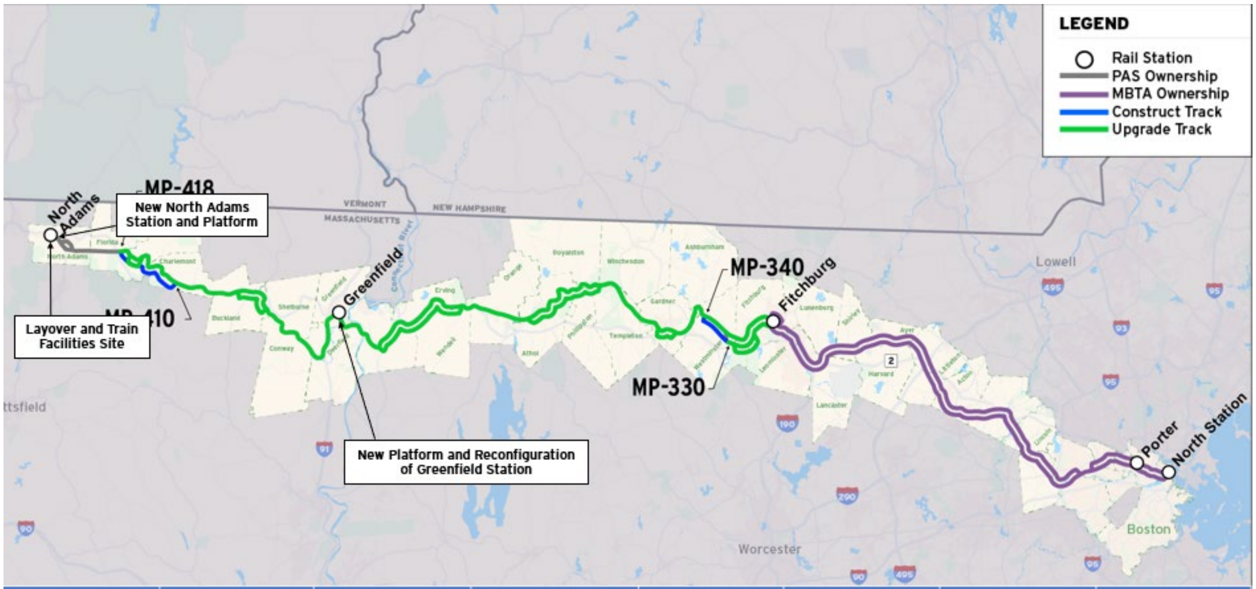

Construction
Right-of-Way
Civil System Contingency at 0% Design
Vehicle Cost
Escalation for Future Cost
Engineering and Permitting

Figure 4.22: Alternative 1 – Lower Investment with Updated Cost Estimates



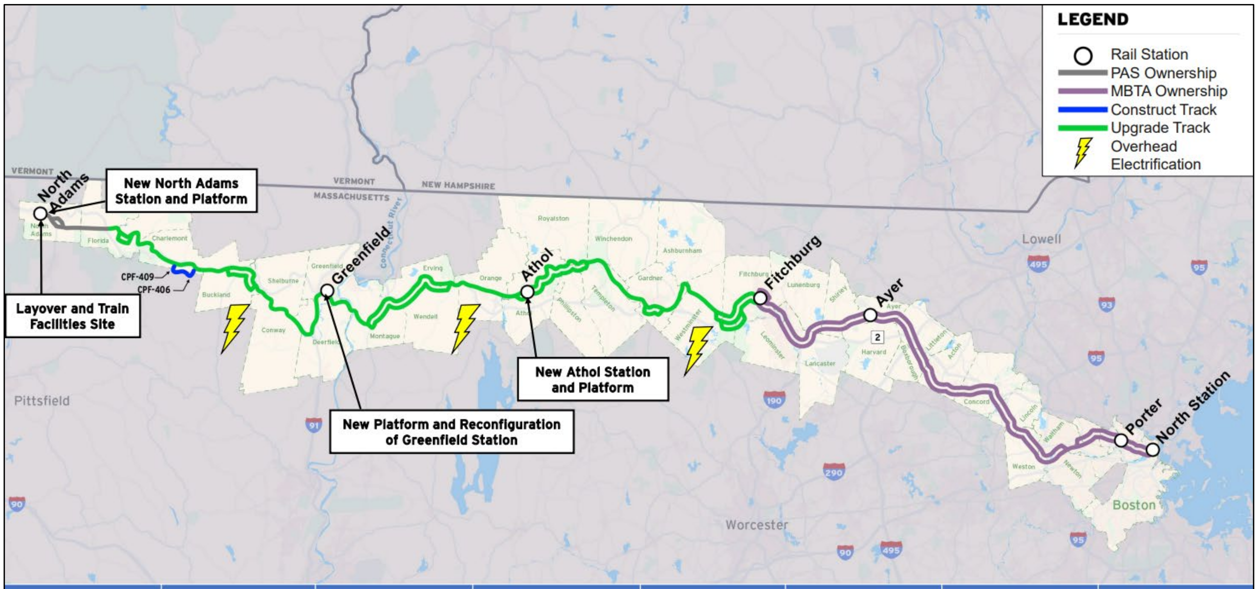
Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
$188,974,450	$429,711,003	$138,189,055	$0	$23,113,097	$15,660,145	$82,945,944	**$878,593,696**

Figure 4.23: Alternative 2 – Higher Investment with Updated Cost Estimates



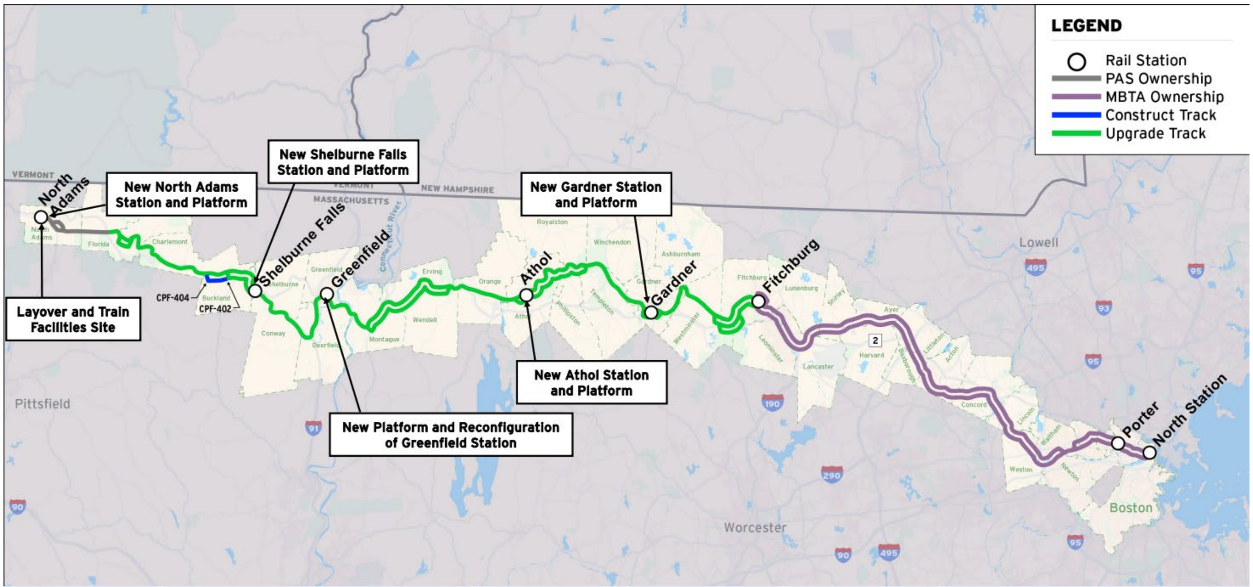
Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
$877,993,288	$429,711,003	$141,368,789	$0	$23,113,097	$15,969,632	$82,945,944	**$1,571,101,755**

Figure 4.24: Alternative 3 – Electrified Service



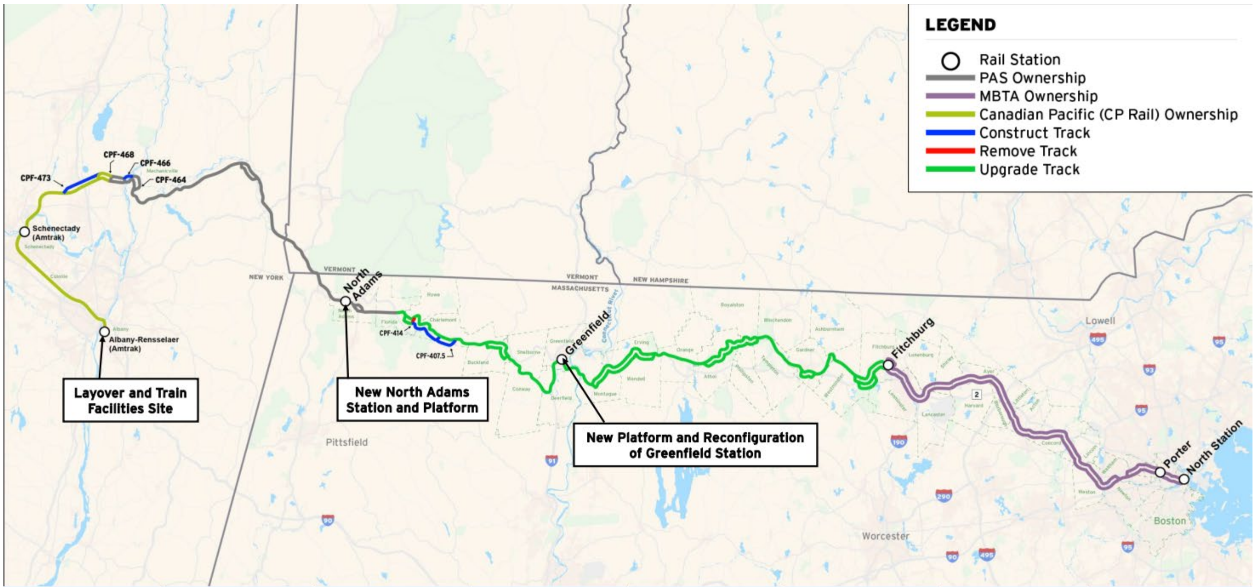
Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
$876,805,373	$429,711,003	$141,368,789	$1,325,887,659	$34,669,646	$15,969,632	$102,087,316	**$2,926,449,410**

Figure 4.25: Alternative 4 – Full Local Service



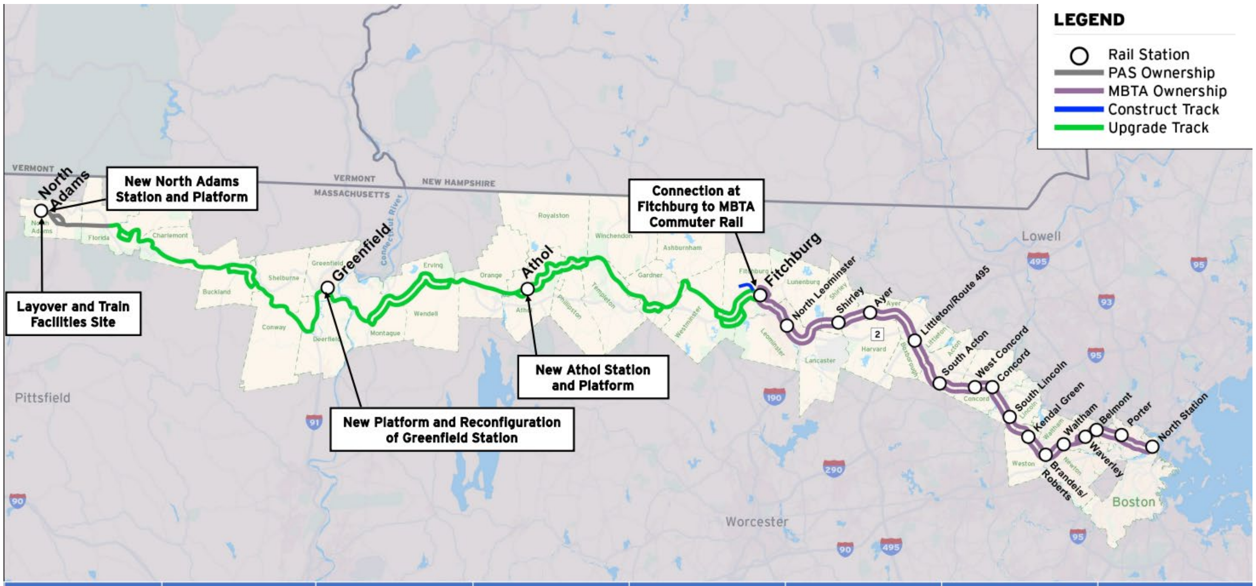
Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
$862,686,962	$429,711,003	$141,368,789	$0	$57,782,743	$15,969,632	$82,945,944	**$1,590,465,076**

Figure 4.26: Alternative 5 – Albany Extension



Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
$1,286,096,089	$429,711,003	$141,368,789	$0	$23,113,097	$0	$82,945,944	**$1,963,234,923**

Figure 4.27: Alternative 6 – Northern Tier Rail Link



Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
$853,049,390	$429,711,003	$141,368,789	$0	$34,669,646	$15,969,632	$82,945,944	**$1,557,714,406**

Table 4.7: Annual Capital Costs for Phase 2 Alternatives

Alternative	Total Capital Cost
Alternative 1 – Lower Investment	$878,593,696
Alternative 2 – Higher Investment	$1,571,101,755
Alternative 3 – Electrified Service	$2,926,449,410
Alternative 4 – Full Local Service	$1,590,465,076
Alternative 5 – Albany Extension	$1,963,234,923
Alternative 6 – Northern Tier Rail Link	$1,557,714,406

Mobility and Access

The two initial service alternatives developed in Phase 1 illustrated the potential mobility benefits of a Northern Tier passenger rail service. Similarly, each of the Phase 2 alternatives provide access benefits arising from the same daily train frequency and create a new mode of travel along the corridor. With five trains per day, all six alternatives provide additional frequency for both work-based and non-work-based trips, such as healthcare-related travel and leisure travel.

The Phase 2 alternatives assume the same higher level of investments of Alternative 3, which allows a 2-hour 49-minute travel time from North Adams to Boston, a travel time that is competitive with driving by personal vehicle during peak travel times. Other attributes of the Phase 2 alternative vary in the number of scheduled station stops. Additional station stops can increase travel time, which sometimes can reduce ridership. Conversely, additional stops can increase the availability of the service to new riders.

Transportation Cost Savings

These estimated transportation cost savings correspond directly to ridership. Alternatives 3 and 4 account for the greatest transportation savings. The lowest savings accrue to Alternatives 6 and 1.

Economic Impact

The inflow of money into an economy produces immediate and longer-term beneficial effects on employment and income and associated secondary ("indirect") effects. The direct economic activity roughly correlates to the estimated total project cost over the duration of the infrastructure project, while the resulting secondary activity can produce a further boost that can make the overall economic impact of the investment exceed its direct cost. Accordingly, the projects with the two highest total project costs - Alternatives 3 and 5 – have the highest expected economic and employment impacts. The lower investment Alternative 1 has the least impact on both metrics.

The total project cost for Alternative 1 is the lowest of the estimates for the six alternatives. Alternative 3, with its added electrification infrastructure, has the highest total project cost. Construction cost is a factor that has advantages and disadvantages and illustrates some of the tradeoffs of the service alternatives. High initial costs can be a challenge to fund or finance. However, the higher cost of design and construction can increase the economic impact at the outset. Once operational, higher levels of project investment, such as more stations or electrification infrastructure, can lead to higher ridership. Therefore, the higher project costs can lead to lower costs per rider and other beneficial impacts of higher ridership.

Figure 4.28: Comparison of Economic Impacts for the Six Alternatives

Evaluation Criteria	**Alt. 1 - Lower Investment**	**At. 2 – Higher Investment**	**Alt. 3 – Electrified Service**	**Alt. 4 – Full Local Service**	**Alt. 5 –Albany Connector**	**Alt. 6 – Northern Tier Rail Link**
Economic Impacts from Construction Output (in millions)	$1,206 over 3 years	$2,263 over 4 years	$4,298 over 4 years	$2,337 over 4 years	$2,834 over 4 years	$2,285 over 4 years
Peak Employment (direct, indirect + induced)	2,679 jobs	3,763 jobs	7,167 jobs	3,980 jobs	4,745 jobs	3,857 jobs

Cost Effectiveness

Figure 4.29 shows the total project cost per route mile of the service. The Lower Investment Alternative 1 has the lowest cost per route mile. The Albany Alternative 5, with its longer route mileage and added investment level, produces the second lowest cost per mile.

Figure 4.29: Comparison of Cost Effectiveness for the Six Alternatives

Evaluation Criteria	**Alt. 1 - Lower Investment**	**At. 2 – Higher Investment**	**Alt. 3 – Electrified Service**	**Alt. 4 – Full Local Service**	**Alt. 5 –Albany Connector**	**Alt. 6 – Northern Tier Rail Link**

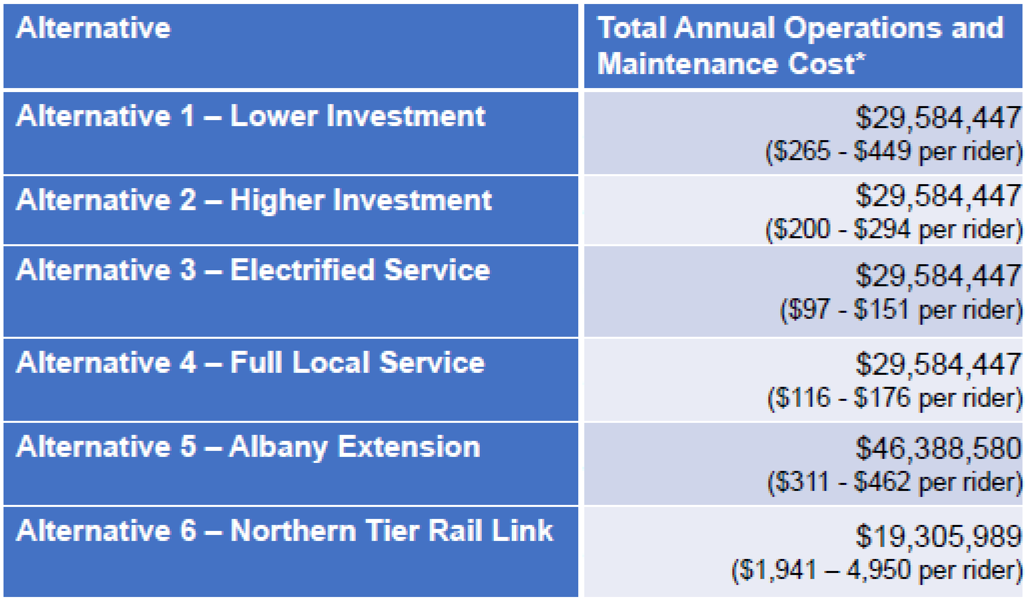
Estimated Annual Ridership	65,880 to 111,460	111,780 to 148,200	196,520 to 304,200	168,040 to 255,460	11,340 to 149,160	3,900 to 23,900
Capital Cost Per Mile	2,679 jobs	$11,064,097	$20,609,150	$11,200,458	$8,803,744	$10,969,819
Capital Cost Per Rider		$10,601 to $15,589	$9,620 to $14,891	$6,225 to $9,464	$13,161 to $19,565	$65,176 to $399,413

Total project cost per rider is shown for the lower end and the higher end of the range for each alternative. Alternative 4, with its full local service and associated estimated ridership, is projected to have the lowest and third lowest total project cost per rider. The higher total project costs may yield higher ridership which may be more cost effective per rider.

The highest costs per rider are associated with Alternative 6, the result of far lower ridership with only modest cost savings.

The annual cost of operations and maintenance (O&M) per rider is another cost effectiveness metric shown in Figure 4.30, with two measures for each alternative corresponding to the ridership range. The lowest O&M costs per rider are associated with Alternatives 3 and 4, as these alternatives are more expensive to design and build, but more cost effective to operate and maintain because they attract more riders. In contrast, the highest O&M costs per rider were produced by Alternative 6. These higher annual costs illustrate the relative impact of lower ridership estimates.

Figure 4.30: Annual cost of operations and maintenance for the Six Alternatives



Alternative	Total Annual Operations and Maintenance Cost*
Alternative 1 – Lower Investment	$29,584,447 ($265 - $449 per rider)
Alternative 2 – Higher Investment	$29,584,447 ($200 - $294 per rider)
Alternative 3 – Electrified Service	$29,584,447 ($97 - $151 per rider)
Alternative 4 – Full Local Service	$29,584,447 ($116 - $176 per rider)
Alternative 5 – Albany Extension	$46,388,580 ($311 - $462 per rider)
Alternative 6 – Northern Tier Rail Link	$19,305,989 ($1,941 – 4,950 per rider)

Note: Annual Operating and Maintenance Costs calculated based on length of operating service

Safety and Air Quality

The ridership estimated for the service alternatives is used to estimate the reduction in vehicle miles travelled per year (VMT) that correlates to the new train riders. Here the reduction in VMTs may be a leading indicator of improved safety and air quality. The new train passengers could result in fewer cars on the road, which could mean lower emissions of pollution and greenhouse gases, a net reduction in traffic congestion may reduce idling in traffic that could mean fewer emissions. And reduced VMT may mean fewer traffic accidents. As noted, this metric has two data points per alternative corresponding to the ridership range. The four largest estimated reductions in

VMT were achieved by Alternatives 3 and 4. This illustrates another tradeoff between higher initial capital costs and continuing positive impacts that support service objectives, such as safety and air quality. Conversely, the four lowest VMT impacts were for Alternatives 5 and 1 – both among the lowest ridership alternatives.

Each alternative, except Alternative 5, has 69 current highway-rail at-grade crossings with a variety of warning systems. The Alternative 5 right of way has 119 grade crossings. During the design and permitting process, these grade crossings would be evaluated for average daily traffic (ADT), current warning systems and other characteristics. An array of mitigations could be considered, including grade crossing elimination, quiet zones, and closure and warning system upgrades. A project construction and commissioning plan would include broad and intense public awareness campaigns. Sponsoring agencies usually work with Operation Lifesaver, Incorporated (OLI) a national educational non-profit that specializes in training in prevention of collisions and injuries around railroads and grade crossings across the country.

Social Equity and Fairness

As in Phase 1, the study team evaluated mobility and access, and social equity and fairness by looking at zero-car households and the environmental justice (EJ) communities located near Northern Tier stations. A Northern Tier rail service may expand travel options for zero-car households around Greenfield, North Adams, and other communities with stations. Phase 2 alternatives provide service more directly to Athol and Shelburne Falls with stations located in those communities, thereby further expanding potential travel options. These stations do increase the ridership of the alternatives that include them.

Impacts on Rail Capacity

The Northern Tier train schedules for all alternatives were developed to work with the MBTA's Commuter Rail service schedule. MBTA Commuter Rail trains and the current freight trains were incorporated into the model and produced minimal impacts on each.

Environmental and Cultural Resources

As with the Phase 1 Alternative 1, most of the infrastructure improvements and the modest increase in service for Phase 2 alternatives primarily stay within the existing right of way. This may minimize or simplify environmental permitting requirements. In the Albany Alternative 5, the North Adam Layover Facility and Yard is replaced by an assumed existing facility in New York State, thereby reducing the alternative's environmental exposure.

Benefit-Cost Analysis

A common methodology for evaluating the impacts of a potential investment through an economic lens is a benefit-cost analysis (BCA), which can provide useful input for selecting a preferred option among various alternatives that are being considered. The study team performed a preliminary BCA of the estimated benefits and costs of the six Northern Tier Passenger Rail service alternatives.

For Northern Tier Passenger Rail, key project benefits include safety, avoided road wear and tear, avoided congestion, avoided emissions, and property value increases near the proposed station areas, while project costs include the up-front capital costs necessary to realize the proposed service, along with ongoing operations and maintenance costs once the service is operational.[19]

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[19] The conventional BCA approach using Federal guidance results in negative benefits due to the requirement to count operating and maintenance (O&M) costs as disbenefits, rather than as costs. For ease of understanding the outcome of the BCA, this modified approach counts O&M as costs rather than disbenefits.

Notably, many Federal grant programs (including Consolidated Rail Infrastructure and Safety Improvements [CRISI] and Rebuilding American Infrastructure with Sustainability and Equity [RAISE]) require a BCA as part of the application.

The following benefit-cost evaluation measures were developed:

- Net Present Value (NPV): NPV compares the net benefits (benefits minus costs) after being discounted to present values using the discount rate. The NPV provides a perspective on the overall dollar magnitude of cash flows over time in today's dollar terms.
- Benefit Cost Ratio (BCR): The present value of incremental benefits is divided by the present value of incremental costs to yield the BCR. The BCR expresses the relation of discounted benefits to discounted costs as a measure of the extent to which a project's benefits either exceed or fall short of the costs.

Table 4.8 presents the Net Present Value, or the overall cash value of the benefits minus the costs, and the Benefit Cost Ratio, or the value of the overall benefits value divided by the costs.[20] A ratio of 1.0 or higher makes a project more competitive for discretionary grants under current federal rules.

Table 4.8: Modified BCA Summary, millions of 2021 $ (discounted at 7 percent unless otherwise stated)

BCA Metric	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5
Safety Benefits	$2.3	$3.8	$6.1	$6.2	$3.8	$0.1
Avoided Road Wear and Tear	~$0.0	$0.1	$0.1	$0.1	$0.1	~$0.0
Avoided Congestion	$2.0	$3.3	$5.4	$5.4	$3.3	$0.1
Avoided Emissions (except CO_2)	- $0.2	- $0.1	$0.1	- $0.1	- $0.2	- $0.1
Avoided Emissions (CO_2 only)*	$0.8	$1.3	$2.4	$2.2	$1.3	~$0.0
Property Value Increase	$21.9	$20.5	$27.9	$42.6	$20.5	$31.9
Total Benefits	- $238.8	- $209.5	- $164.5	- $167.0	- $358.7	- $150.6
Total Costs	$542.1	$941.7	$1,701.3	$953.4	$1,177.8	$964.5
NPV	- $780.9	- $1,151.2	- $1,865.8	- $1,120.4	- $1,536.5	- $1,115.1
BCR	- 0.44	- 0.22	- 0.10	- 0.18	- 0.30	- 0.16
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5

* Discounted at 3% rate

Table 4.9 shows the results of a sensitivity analysis, which examined halving the capital and O&M costs. The Net Present Value range under these reduced cost circumstances ranges from -$370 million to -$893 million.

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[20] The time horizon over which the BCA and NPV was calculated consisted of the construction period plus thirty years of operation. With the years of design and construction varying by scenario, the overall duration varied somewhat across the scenarios.

Table 4.9: Impact of Halving Capital and O&M Costs to Break-Even Ridership Multipliers (millions of 2021 dollars)

BCA Metric	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Net Savings	-$125.68	-$107.58	-$84.20	-$92.59	-$182.21	-$91.08
Safety Benefits	$2.30	$3.80	$6.10	$6.20	$3.80	$0.10
Avoided Road Wear and Tear	~$0.0	$0.10	$0.10	$0.10	$0.10	~$0.0
Avoided Congestion	$2.00	$3.30	$5.40	$5.40	$3.30	$0.10
Avoided Emissions (except CO_2)	-$0.20	-$0.10	$0.10	-$0.10	-$0.20	-$0.10
Avoided Emissions (CO_2 only)*	$0.80	$1.30	$2.40	$2.20	$1.30	~$0.0
Property Value Increase	$21.90	$20.50	$27.90	$42.60	$20.50	$31.90
Total Benefits	-$98.88	-$78.68	-$42.20	-$36.19	-$153.41	-$59.08
Total Costs	$271.05	$470.85	$850.65	$476.70	$588.90	$482.25
NPV	-$369.93	-$549.53	-$892.85	-$512.89	-$742.31	-$541.33
BCR	-$0.36	-$0.17	-$0.05	-$0.08	-$0.26	-$0.12

* Discounted at 3% rate

Each alternative has some advantages. The BCA quantifies some aspects of the relative merits of the alternatives. However, stakeholders and policy makers may balance the tradeoffs among alternatives.

Findings

Each of the six alternatives could provide economic benefits for the region, in proportion to the magnitude of the total project costs. Schedules and service that attract riders could be created that minimize interference with existing freight and passenger rail service. Based on the numerous areas of environmental and cultural sensitivity that have been noted and inventoried, most of the alternatives remain primarily within the existing right-of-way, which should minimize environmental permitting issues.

Each alternative provides some benefits associated with the estimated level of ridership, with more benefits accruing to the alternatives with higher ridership, including:

- Reduced project and operating costs per rider
- Transportation cost savings for individuals
- Air quality and safety benefits
- Mobility and social equity

CHAPTER 5: PASSENGER RAIL PLANNING AND IMPLEMENTATION PROCESS OVERVIEW

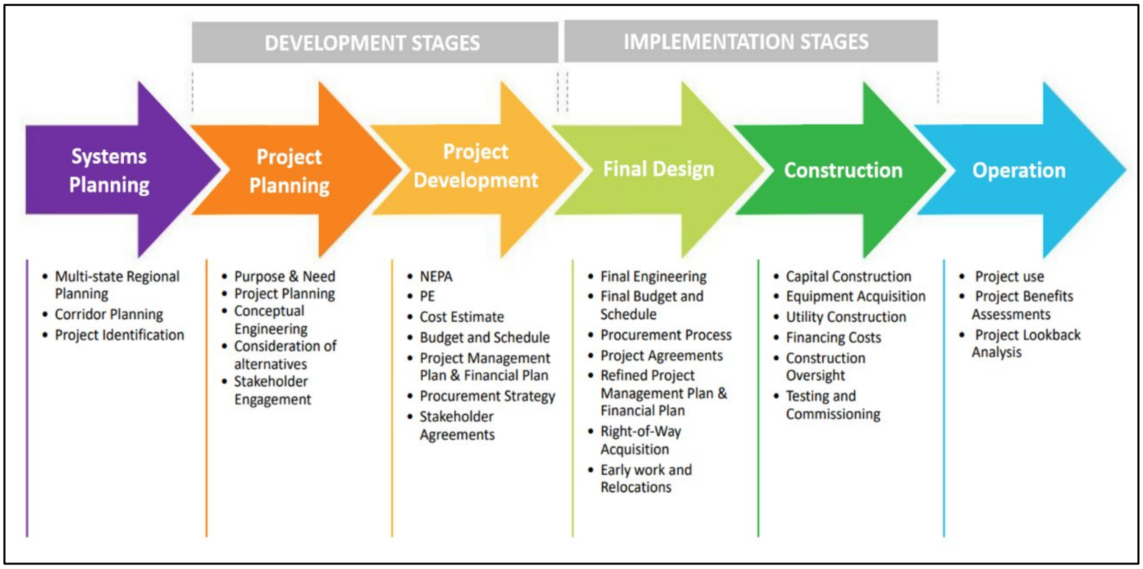
The environmental permitting, engineering, and design that precede construction are essential and often lengthy processes. In addition, the provision of rolling stock is a critical consideration in establishing a timeline to initiate a passenger rail service. These processes have conditions that must be met before they can begin.

This chapter provides a high-level overview of the passenger rail planning and implementation process, including planning, permitting, financial, and institutional coordination activities that must be performed and are necessary for any passenger rail project implementation.

Passenger Rail Project Development

The Federal Railroad Administration organizes the steps required to implement an intercity passenger rail project into six stages.

Figure 5.1: FRA Project Development Lifecycle



Source: Guidance on the Development and Implementation of Railroad Capital Projects U. S. Department of Transportation Federal Railroad Administration January 11, 2023

Systems Planning is "a high-level planning process …[that] examines broad needs, challenges and opportunities that can be addressed with a transportation-related solution, including capital projects."[21] This planning takes place in a multimodal context in which rail is one of the possible transportation solutions. The Northern Tier Passenger Rail Study is in this pre-development stage of corridor planning.

Development Stages

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[21] Federal Railroad Administration Guidance on the Development and Implementation of Railroad Capital Projects, page five. https://railroads.dot.gov/sites/fra.dot.gov/files/2023-01/FRA%20Guidance%20on%20Development%20and%20Implementation%20of%20Railroad%20Capital%20Projects.pdf.

During the Project Planning stage, the sponsoring agency "identifies capital project concepts to adequately address transportation needs and opportunities."[22] This stage includes analysis of the project alternatives that supports the decision-making processes to determine the solutions to implement. Also, the sponsoring agency would engage the various stakeholders in the planning process to assist in evaluating project impacts.

The Project Development stage includes design, environmental and related analysis "to ensure the project is ready for implementation."[23]

Implementation Stages

Final Design is the stage at which the Federal Railroad Administration may consider project funding. Final design produces the engineering plans necessary to proceed to construction.

In addition to the actual construction of the railroad infrastructure such as track and signals, the Construction stage includes the acquisition of rail rolling stock and the testing and commissioning of the fixed infrastructure and the rolling stock. Commissioning ensures the railroad system is functioning properly and is ready to begin service in the next stage, Operation.

The Operation stage includes the provision of service to its end users and the continuing assessment of the project and its benefits.

If the project will engage other states or have multistate impacts, the project proponent would have to advance Multi-state Regional Planning. To qualify for Federal Railroad Administration funding, a project would have to be defined and identified in a future Federal Railroad Administration process.

Systems Planning would continue until Project Identification and funding are approved to move into Project Planning. If interim phasing of services is considered, such as seasonal and/or weekend service, the project could extend over several Federal Railroad Administration and state grant cycles.

As the project moves into the Project Planning stage, the project proponent and its partners would need to advance a series of steps to allow for conceptual engineering. Planning with stakeholder engagement would lead to a set of alternatives and a preferred alternative.

Sample Implementation Timeline

The timeline for negotiations for any given agreement is unique to the specific conditions of the project and the relationships and relative negotiating positions of the parties.

While host railroads often prefer to perform as much work as possible with their own forces, railroads operating along the corridor could contract out construction due to staffing availability and any specialized work that may be needed. For example, any electrified work likely would require specialized workforces. Therefore, a bidding process would be assumed.

The timeline commences with confirmation of funds for rolling stock, design, permitting and construction and assumes necessary additional planning would be performed as funded while the major funding is secured. It illustrates the building blocks that are used in systems planning and project planning: planning, funding applications, iterative negotiations, and service modeling leading to agreement on infrastructure improvements.

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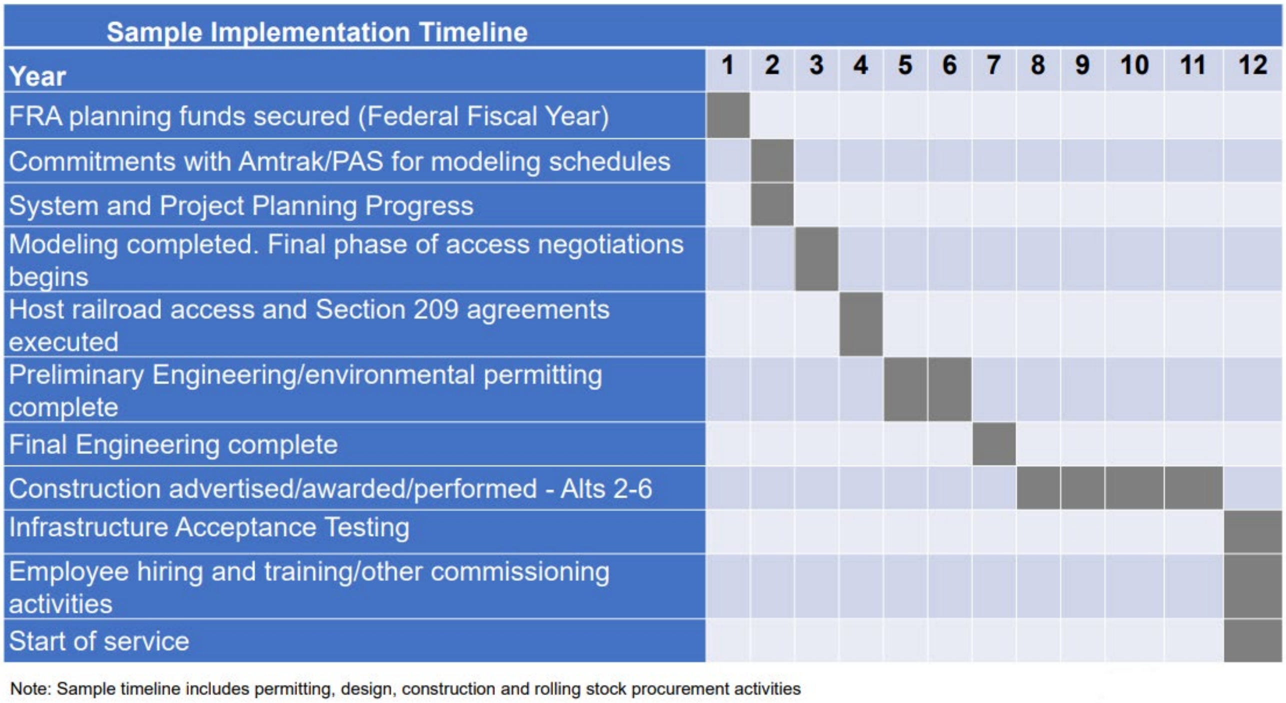
[22] Ibid.

[23] Ibid., 8.

Figure 5.2: Sample Project Implementation Timeline



Sample Implementation Timeline

Year	1	2	3	4	5	6	7	8	9	10	11	12
FRA planning funds secured (Federal Fiscal Year)	■											
Commitments with Amtrak/PAS for modeling schedules		■										
System and Project Planning Progress		■										
Modeling completed. Final phase of access negotiations begins			■									
Host railroad access and Section 209 agreements executed				■								
Preliminary Engineering/environmental permitting complete					■	■						
Final Engineering complete							■					
Construction advertised/awarded/performed - Alts 2-6								■	■	■	■	
Infrastructure Acceptance Testing												■
Employee hiring and training/other commissioning activities												■
Start of service												■

Note: Sample timeline includes permitting, design, construction and rolling stock procurement activities

Source: HNTB

The first step in this timetable is securing funds for additional planning. The sponsoring agency could start to engage with the planned operator and the owner and/or operator to agree on data sharing and an approach to modeling the proposed service. The modeling progresses as System and Project planning continue.

When the modeling is complete, the proposed service alternative schedule and required infrastructure elements are refined. The sponsoring agency and the railroad owner/operator would have the information necessary to negotiate the terms and conditions under which the owner/operator would allow the sponsoring agency to use its right of way for the new passenger rail service. The terms might include the commitment of the sponsoring agency to fund all infrastructure upgrades necessary to operate the passenger service. In parallel with the access negotiations, the sponsoring agency could negotiate a PRIIA Section 209 agreement with the designated passenger train operator.

The passenger rail project would then move into Project Development which ends when preliminary design/engineering and environmental permitting are complete. Project Implementation begins with final engineering. Final design plans allow the project to move into the Construction stage. At various phases of construction, the infrastructure is tested for compliance with the plans and specifications. Final testing and commissioning activities prepare the railroad for service. This includes training of the operating crews on the updated right of way. With testing and commissioning complete, the sponsoring agency and railroad owner/operator can authorize the commencement of service.

Passenger Rail Equipment – Locomotives and Coaches

The arrangement for rolling stock is not included in this sample timetable, as there are several alternatives for the acquisition of rolling stock. The passenger rail service operator may supply the rolling stock for state-sponsored services, unless the sponsoring state chooses to use equipment it owns or plans to purchase.

To address a potential need for additional rolling stock, coaches could be refurbished to cover any gaps.

Potential Funding Opportunities

Intercity passenger rail services are primarily funded through a mix of federal, state, and local sources.

While capital costs are often substantially funded by the federal government, ongoing operating and maintenance costs are typically born by state budgets. One notable exception is the *Downeaster*, which relied in part on federal Congestion Mitigation and Air Quality (CMAQ) Improvement funding to support operations following its inception in 2001.

Federal

At the federal level, most potential sources of funding for capital improvements are in the form of discretionary grants. Presently, these include the following programs:

- The **Consolidated Rail Infrastructure and Safety Improvements** (**CRISI**) Program, which supports projects that improve the safety, efficiency, and reliability of intercity passenger and freight rail.
- The **Federal-State Partnership for Intercity Passenger Rail Grant** Program provides funding for capital projects that reduce the state of good repair backlog, improve performance, or expand or establish new intercity passenger rail service.
- The **National Infrastructure Project Assistance Program** (**MEGA**) supports large, complex projects that are likely to generate national or regional economic, mobility, or safety benefits.
- The **Nationally Significant Multimodal Freight & Highway Projects** (**INFRA)** program is for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas.
- The **Rural Surface Transportation Grant Program** supports projects that improve and expand the surface transportation infrastructure in rural areas to increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life.
- The **Railroad Crossing Elimination Grant Program** provides funding for highway-rail grade crossing improvement projects.
- The **Rebuilding American Infrastructure with Sustainability and Equity** (**RAISE**, previously BUILD and TIGER) program can fund road, rail, transit, and port projects that promise to achieve national objectives.
- Under the **Restoration and Enhancement** grant program, federal funds may be used to cover a share of the operating costs of new passenger train services that decline from 90% to 30% over six years.

These programs are highly competitive, with success depending in part on presenting a strong case with respect to benefit-cost analysis and mobility improvements, and typically require non-federal matching funds to be eligible.[24] Applications through the INFRA, MEGA, and Rural programs would need to make a freight-focused case.

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[24] Higher local shares are viewed more favorably in many instances.

The Intercity Rail Corridor Identification and Development (Corridor ID) Program is intended to create a pipeline of intercity passenger rail projects ready for implementation. Corridors selected to be part of the program will be eligible for future federal formula funding. Currently in its initial implementation phase, the first round of Corridor ID applications was on March 20, 2023, with selections announced in late 2023. All selected recipients receive $500,000 in initial funding that can be applied towards various planning efforts, depending on the current state of the corridor and planning needs. Additional funding would then be provided on a formula basis.

In addition, passenger rail projects are eligible under two federal loan programs (the Railroad Rehabilitation and Improvement Financing (RRIF) program and the Transportation Infrastructure Finance and Innovation Act (TIFIA) program) both require a revenue source for repayment. Environmental permitting strategies have to be coordinated with funding strategies to ensure permitting approach meets federal requirements.

State

Funding sources could include direct legislative authorization or use of State Bond Cap funds. The Bond Cap is Commonwealth General Obligation bond proceeds that are allocated to specific projects, primarily for project design, management, operations, and other construction support. In addition, the Commonwealth Rail Enhancement Program (REP) is a dedicated initiative for reliability, modernization, and expansion initiatives.

MassDOT contributes money from its operating budget to support operations on the Amtrak Hartford Line, *Valley Flyer*, and *Vermonter*, consistent with requirements for PRIIA Section 209 State-Supported Amtrak Services. MassDOT’s non-toll operating budget is primarily funded through the Massachusetts Transportation Trust Fund and Commonwealth Transfer Fund.

Local

Some transportation agencies have formalized agreements and/or cost allocation formulas defining how much funding will be allocated every year by municipal partners and how cost sharing by funding partners is determined. These transit agencies generally do not have a dedicated funding source, and most of their revenue comes from jurisdictions in the service area. Examples include Hampton Roads Transit and Washington Metropolitan Area Transit Authority (WMATA) in the Washington, D.C. area. In these cases, the local funding model distributes operating and capital funds across the jurisdictions.

Value capture is one funding strategy by which public or private entities capture a portion of the increased land value resulting from infrastructure improvements, rezoning, or other development activities. This mechanism allows these entities to fund public projects or initiatives by harnessing the enhanced value that arises due to the improvement, ensuring that the public benefits from the economic gains generated by real estate growth and transformation.

Tax increment financing (TIF) is a second approach to capturing new value generated by rail line development. In Massachusetts, the Urban Center Housing Tax Increment Financing Program limits those improvements to promotion of housing and commercial development. Using a TIF, a municipality issues bonds to pay for improvements in a designated district and then repays those bonds with the additional tax revenue generated from the resulting property value increases. In this case, station improvements, local transportation facilities, or other capital improvements related to the rail service could be funded through a TIF.

Parking User Fees

Parking revenues from surface lots and structured parking facilities alongside stations and owned by the local municipality or the rail service operator, could contribute to funding the service. There are a number of different approaches to pricing the parking in these facilities, including charging daily parking fees, monthly reserved parking, short-term metered parking, and long term/multiday parking.

Joint Development

Joint development refers to private real estate development or development partnerships on transit agency properties within or adjacent to transit stations to promote Transit-Oriented Development (TOD). A variety of development solicitation structures are used for joint developments.

Most agencies prefer to use long-term land leases to secure a long-term revenue stream and maintain control over development and land use surrounding stations and protect transportation functions. However, land leases are not always appropriate, and agencies employ a variety of techniques to partner with private developers. Developer agreements and deed restrictions (e.g., covenants, codes, and restrictions) can be used to specify the nature of development and land use if agency property is sold to a private party. Deed restrictions specify allowable uses and other criteria and can be attached to a property in perpetuity if desired. Subdividing critical property such as parking, pedestrian circulation, and the station platform from the larger transit-oriented development is also a way to ensure that operations are protected.

The expected rate of return on the land varies greatly depending on a variety of factors, including the real estate market and the relative importance of revenue generation in comparison to other objectives. An acceptable land lease or sale rate will vary within an individual market depending on the attractiveness of the location and the immediate area real estate conditions.

Naming Rights

Naming rights are a payment for the right to put a company name on a piece of infrastructure. In the context of transit, this could mean a transit station or rail line. Commonly used in other settings such as sports stadiums or arenas, there are relatively few examples in transit. Southeastern Pennsylvania Transportation Authority (SEPTA) and Metropolitan Transportation Authority (MTA) have sold naming rights to stations near sports arenas, Cleveland’s Bus Rapid Transit (BRT) line is sponsored by a medical center, and Dallas Area Regional Transit (DART) is offering the naming rights for four train lines and 61 stations. In 2016, RTD-Denver sold naming rights for the A train (between Downtown and Denver International Airport) to the University of Colorado for $5 million for 5 years (annual revenue of $1 million). Naming rights for transit lines and stations are somewhat controversial, in particular in cases where the name might reduce the ease of wayfinding.

Permitting Requirements

Projects supported in part by funding from the Federal Railroad Administration (FRA) may warrant regulatory review in compliance with the National Environmental Policy Act (NEPA). NEPA requires that a federal agency disclose the effects of any agency action (including permitting or financial assistance) on the environment.

There are three classes of action that direct the level of documentation required to comply with NEPA, ranging from the simplest (Categorical Exclusions (CE)) to the most complex (Environmental Impact Statements (EIS)).[25] A class of action determination is dependent on the scope of work and due to the level of reporting and agency coordination requirements, has varying implications on project schedule.

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[25] https://railroads.dot.gov/rail-network-development/environment/fra-nepa-documentation

The project sponsor and recipient of FRA funds, in coordination with FRA, would be responsible for identifying and preparing the appropriate level of NEPA documentation. The class of action determination must be approved by the lead federal agency in advance of preparation.

Categorical Exclusion (CE)

A CE is a category of federal agency action that does not individually or cumulatively have a significant effect on the human environment.[26] The project sponsor must demonstrate that the scope of work meets the criteria for categorical exclusion and does not involve any unusual circumstances that may require additional NEPA documentation. The FRA lists actions that typically meet the criteria for Categorical Exclusion at 23 CFR 771.116(c). NEPA review is complete when the lead federal agency approves the application of a CE for the project. A typical timeline for processing a CE is 90 days.

Environmental Assessment (EA)

An EA is a category of federal agency action that has the potential to result in significant impacts to the human environment. The Fiscal Responsibility Act, which was signed into law by President Joseph Biden in June 2023, requires that an EA be completed by the project sponsor within one-year.[27]

The EA should include the purpose and need for the proposed action, discussion of alternatives, and the environmental impacts associated with each.[28] If the lead federal agency determines that the proposed action will not result in significant environmental impacts, the agency will issue a Finding of No Significant Impact (FONSI) to complete the NEPA process. If the EA concludes that the proposed action will result in significant environmental impacts, the proponent will prepare an Environmental Impact Statement.[29]

Environmental Impact Statement (EIS)

An EIS is a category of federal agency action that will result in significant impacts to the human environment. The Fiscal Responsibility Act requires that an EIS be completed within two years. The project sponsor must prepare a Draft EIS (DEIS), which includes the purpose and need for the proposed action, discussion of alternatives, and the environmental impacts associated with each. The DEIS is then subject to public comment for a minimum of 45 days. The nature and extent of public comments will inform the need for further analysis. A Final EIS is then published, which refines the proposed action and provides responses to substantive public comments. An EIS is developed in parallel with Preliminary Engineering. The EIS process concludes with the issuance of a Record of Decision (ROD), which summarizes the federal agency action, evaluated alternatives, and plans for mitigation and monitoring.[30]

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[26] https://railroads.dot.gov/rail-network-development/environment/fra-nepa-documentation#:~:text=Categorical%20Exclusion%20(CE),required%20(40%20CFR%201508.4)

[27] https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title42-section4336a&num=0&edition=prelim#:~:text=(A)%20Right%20to%20petition,order%20under%20subparagraph%20(B).

[28] https://www.epa.gov/nepa/national-environmental-policy-act-review-process#:~:text=Summary%20of%20the%20EIS%20Process&text=A%20draft%20EIS%20is%20published,provides%20responses%20to%20substantive%20comments.

[29] https://railroads.dot.gov/rail-network-development/environment/fra-nepa-documentation

[30] https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25(38)_FR.pdf

For complex projects that will result in significant impacts to the human environment, the lead federal agency may adopt a tiered approach to complete the NEPA process. A tiered approach provides a broad project-wide analysis of environmental impacts through preparation of a Tier 1 EIS and a more detailed analysis of specific project components through preparation of a Tier 2 study. Tier 2 studies may be an EIS, EA, CE, or a combination of classes of action. As funding becomes available, FRA should be consulted to confirm the appropriate class of action for compliance with NEPA. Except for the circumstances provided in 23 CFR 771.113(d), the final design, property acquisition, purchase of construction materials or project construction cannot begin until the NEPA process has been completed.

CHAPTER 6: FINDINGS & RECOMMENDATIONS

In the preceding chapters, the estimated benefits, costs, and investments related to Northern Tier Passenger Rail have been outlined. Thus, this chapter begins with the key findings and conclusions of the study, and the opportunities and challenges that must be addressed.

The chapter concludes with recommended next steps for consideration.

Key Findings

The following travel patterns were identified along the corridor:

- The majority of daily trips stay within the segment of the Northern Tier corridor from which they originate.
- The East segment shows a strong orientation toward communities in and around Boston. The Central segment shows Fitchburg, Leominster, and Gardner as the top three destinations for trips originating in the segment. The West segment has a strong north-south orientation for trips, suggesting that many people living in the region travel to Pittsfield and Springfield for work, medical care, or other trip purposes.
- West of I-495, travel in the corridor is predominantly by motor vehicle use.
- Typical travel time between North Adams and Boston ranges from 2.5 to 3 hours.

With respect to the potential service alternatives, while all of the service alternatives provide connectivity, mobility, and transportation choice in the Northern Tier corridor, Alternative 3 (Electrified Service) and Alternative 4 (Full Local Service) achieve the highest ridership levels of the six potential alternatives. Alternative 3 is estimated to have its estimated annual ridership range between 196,520 and 304,200 riders. Alternative 4 is estimated to have its annual ridership range between 168,040 and 255,460 riders.

Higher ridership levels represent more reductions in vehicle miles travelled (VMT) and equate to reduced automobile emissions and crashes. Alternatives 3 and 4 also lead this ridership-based metric of the six service alternatives examined.

Alternative 3, with its extensive electrification infrastructure, has the highest total capital cost with accompanying economic benefits.

The community and safety impacts are the same for all alternatives except the Albany Extension Alternative 5, which has more grade crossings over its longer route. The other alternatives have the same number of crossings and trains and therefore the same safety exposure.

Stakeholders have expressed support for Alternative 3 and Alternative 4, as well as Alternative 5 (Albany Extension) and have expressed interest in additional stops along the corridor (e.g., Williamstown and Charlemont).

The lowest annual cost of operations and maintenance per rider are associated with Alternative 3 and Alternative 4. These alternatives are more expensive to design and build, but more cost effective to operate and maintain because they are estimated to have the highest ridership of the six alternatives.

Given the estimated benefits and costs associated with each of the six alternatives, the benefit-cost analysis indicates that the benefits may not offset the capital costs required for implementation.

Conclusions

While the fundamental scale of ridership and cost is established, more work would be needed to further develop the markets, ridership, costs and benefits from a transportation planning perspective. The benefit-cost analysis detailed in Chapter 4 indicates the challenges presented in applying for and receiving federal funding under current discretionary grant program criteria.

This assessment reveals a complex set of opportunities and challenges. It represents the beginning of a process of further action that may lead to enhanced transportation access and improved economic opportunities for Massachusetts' Northern Tier corridor. Key conclusions are as follows:

1. **Based on current demographic and economic trends, much of the projected ridership is concentrated on the section east of Fitchburg** where the opportunity for a 30-minute reduction in travel time to Boston could attract new riders who are not using the existing MBTA Commuter Rail service.
2. **Due to the timeline for implementing any passenger rail service corridor, mobility improvements should be explored** that could provide connectivity in the shorter term. Similarly, coordinated regional and municipal planning to support any implementation should be undertaken.
3. **The rail along the Northern Tier corridor is a strategic asset for the entire Commonwealth and should be treated as such**. The line provides a vital alternative to the CSX former Boston and Albany route between Selkirk, NY, Springfield, and Worcester. Given the competitive options for freight service that this route offers, the societal and environmental benefits of freight rail, as well as utility for mitigating increasing climate risks, ensuring a long-term future for this route is warranted. The significance of this route for handling freight should also be considered in the context of service between Pittsfield and Boston, which will see increased use of the CSX main line for passenger rail service and thus the potential need to provide alternative routing for freight traffic.

Although the creation of the Pan Am Southern joint venture between Pan Am and Norfolk Southern in 2009 brought significant improvements to the corridor through a series of rail and tie upgrades, overall conditions west of Wachusett may necessitate significant investment to achieve a state of good repair (not including capacity improvements for passenger rail service).

At present, most of the route west of Wachusett is being operated at speeds of up to 30 miles per hour for freight. While much of the expense for improvements may be borne by the private owners, some public investment may be necessary such as renewal of the Hoosac Tunnel. Furthermore, to ensure the long-term vitality of the route for freight, clearances should be raised to accommodate domestic double-stack intermodal service. MassDOT has progressed this process with its Patriot Corridor Double-Stack Clearance Initiative evaluation of the corridor from Ayer to the Vermont state line.[31] The study identified 23 structures that require modification for double-stacked container trains. Further action will depend on the availability of funding for design and construction.

Issues and Opportunities

Passenger rail service development involves a variety of agencies, communities, and other stakeholders. As a result, the potential re-introduction of passenger rail service presents a number of challenges and opportunities.

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[31] https://www.mass.gov/patriot-corridor-double-stack-clearance-initiative

Governance. As part of Chapter 176 of the Acts of 2022, the Western Massachusetts Passenger Rail Commission was established to identify entities that could build and manage intercity passenger rail service. Comprised of elected officials and planning and transportation agency representatives, the Commission conducted several meetings across Western Massachusetts, hearing testimony and presentations. The Commission released its final report in November 2023 which determined that MassDOT should continue to lead the Commonwealth's programs for planning, developing, and managing intercity passenger rail services.

Integration with Other Services. MassDOT through its Rail and Transit Division announced a new approach and brand for the Commonwealth's present and future intercity rail services: Compass Rail. This approach, with includes Amtrak, CSX, the states of Connecticut, New York and Vermont and other partners, aims to unify east-west and north-south services with a robust hub in Springfield where intercity services meet. Should potential service along the Northern Tier advance to further stages of development, it could become part of Compass Rail.

Access Considerations. MassDOT has determined that intercity services would be operated by Amtrak as a state-supported service under Section 209 of the Passenger Rail Investment and Improvement Act (PRIIA) of 2008. Section 209 of PRIIA established the framework for cost allocation between state-sponsors of intercity service and Amtrak.

Amtrak has a statutory right to access the rights-of-way of other railroads in order to operate passenger rail service. Under federal law, Amtrak has the right to operate its trains on any railroad, including private freight railroads. However, securing those rights requires the negotiation of terms and conditions of access with the host (owner) railroad. The terms and conditions include changes or additions to the railroad infrastructure, liability, maintenance and on-time performance standards and fees for access.

An arrangement with Amtrak would include an agreement in principle as to whether Amtrak or MassDOT would take the lead in the negotiation of the access rights with the host railroad. On the Northern Tier corridor, the host railroads are the MBTA and the Pam Am Southern, owned by CSX and Norfolk Southern. Regardless of who takes the lead in the negotiation of the access agreement, the negotiation likely would be preceded by an agreement on a process to model the operation for one or more alternatives on the host railroad right-of-way. This modeling has several purposes, chief among them is to provide an understanding of the impact of the proposed passenger schedule on the host railroads' services.

The modeling also demonstrates the infrastructure elements that are required to operate new and current services at the required level of performance. With this information, MassDOT (directly or as Amtrak's client) can initiate the negotiation of access agreements with the host railroads; these agreements would confirm the infrastructure elements that are required for the service. This coordination on infrastructure is essential to moving into the Project Development Phase when environmental permitting and preliminary engineering can advance.

This discussion of timeline assumes that MassDOT would be able to negotiate with the MBTA for the use of the Fitchburg Line because the Northern Tier service alternatives are based on compatibility with existing MBTA infrastructure and current MBTA service.

MassDOT's experience with the East-West Passenger Rail project illustrates part of this process. The East-West Passenger Rail Study concluded in 2021, which examined rail service alternatives along the Boston-Worcester-Springfield-Pittsfield corridor. The CSX acquisition of Pan Am Railways and its share of Pan Am Southern needed to be resolved before additional actions could progress. The Surface Transportation Board's approval of the CSX acquisition included certain CSX commitments to work with Amtrak and MassDOT on passenger rail service on the East-West corridor.

In December 2022, MassDOT, in partnership with Amtrak and CSX, applied for a Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant from the FRA to fund certain capacity improvements between Worcester and Springfield. The grant is specifically geared to the Inland Route; however, its improvements would be an essential foundation to an East-West Service. In the summer of 2023, MassDOT, CSX, and Amtrak worked together to initiate the modeling of the CSX right of way, to be completed in the spring of 2024. The modeling results will refine the list of infrastructure improvements to be designed and constructed under the CRISI grant. This information is one of the elements required to complete CSX, Amtrak, and MassDOT discussion of the implementation of the design/construction and operation of the service. While such discussions can progress before this information is developed, typically the infrastructure needs are part of an agreement for access on the host railroad. FRA can require that MassDOT, the host railroads, and the operator Amtrak agree on the infrastructure requirements as a condition to moving into Project Development.

An additional factor that affects the timeline before permitting, design and construction could begin is funding of the infrastructure improvements. The host railroad may require that infrastructure funding be in place before it undertakes negotiation of one or more elements of an access agreement (e.g., service schedule).

Existing Infrastructure. The Pan Am Southern corridor is a critical asset for Massachusetts over and above its potential for intercity passenger rail service. It is a strategic asset for freight and provides resiliency for the state’s rail network as a parallel route.

Detailed information about the Pan Am Southern bridges is not known, however, contingencies in the cost estimates likely would cover most costs. Another structure, the Hoosac Tunnel, has well known infrastructure issues. Future efforts to rehabilitate or upgrade the single-track tunnel may require diversions of rail service – both freight and passenger. The cost estimates Pan Am Southern bridges are structures to account for unknown factors using contingencies. However, it is possible that some of these key assets may need work that exceeds the standard contingencies.

The Northern Tier rail corridor currently has two distinct characteristics: the MBTA Fitchburg Line service for commuter rail and the Pan Am Southern segment west of Wachusett for freight service. Therefore, infrastructure improvements would be required to accommodate intercity passenger service and limit impacts to existing and future freight and passenger services. The western Pan Am Southern segment traverses hilly terrain that has led to a railroad right-of-way with many curves and elevation changes that constrain train speeds and capacity. In addition, over the years double tracking has been removed, however the right-of-way remains making capacity improvements feasible.

Historic stations have evolved from their original uses to a variety of new uses, although some retain the physical capacity for a modern, accessible intercity passenger service.

Current Population Projections. Population growth and economic development along the Northern Tier corridor in recent years has varied considerably, with substantial growth between Boston and Fitchburg, and slower growth and/or decline as areas get further west. The variations in population growth are reflective of complementary trends, where total jobs and real estate values in the east are large and growing while these indicators are steady or in decline further west. If these trends persist, it is probable that more households will be pushed further out into the west by the cost of housing but anchored to the Boston region through the employment and services it offers.

The population in the study corridor, particularly west of Fitchburg, is currently static and has been projected for long-term decline. Part of the rationale for Northern Tier Passenger Rail is to potentially reverse this trend.

When considering these factors, the proposed project may help to support economic development if it can generate new employment from this expanded connection. Therefore, any expectation of induced demand from population growth as a result of this project should be sufficiently modest. While current population, employment, and travel trends, as well as attracting an auto-reliant population to a new rail service may pose challenges, attractors are present along the entire length of the corridor which may induce recreational as well as work and other trips.

Potential service options – with varying travel times and frequencies, as well as stops and station locations – may influence the degree to which train service could draw existing travel from highway to rail.

Further evaluation would be required to demonstrate whether pandemic-induced changes in population trends and travel patterns will alter current projections. Regional and local planning efforts can explore factors that may leverage a rail service to attract migration and support economic growth in the corridor. Further analysis of the tourism market and the college and university transportation trends may yield additional actions.

Intersection of Housing and Transportation. Transportation and land use have strong linkages that are increasingly being recognized by the Commonwealth of Massachusetts. The enacted Massachusetts General Laws, Chapter 40A, Section 3A (the MBTA Communities Law) recognized this connection, requiring communities to update local zoning to allow for multi-family housing by-right near MBTA stations. Higher capacity transportation not only benefits from greater residential density nearby, but the inverse is also true – higher residential density benefits from having higher capacity transportation serving it. For instance, the presence of a rail line may incentivize households to move nearby for their work commute or other purposes; ridership is then enhanced by having people nearby frequently using the new service.

New transit options could benefit the residents in zero-car households identified in the corridor, while increasing choice for others.

Communities along the Northern Tier may need to develop plans that both attract new residents and visitors, as well as accommodate their service needs. In preparing for any increase in population, communities should consider master planning and zoning for opportunities to increase the supply of housing and supporting municipal services and infrastructure.

As discussed, many of the communities along the proposed corridor have seen population leveling and/or decline. Should that trend reverse, communities would need to consider:

- **Zoning**: Existing land use regulations may not be able to support new housing to the extent needed by new population growth. The zoning bylaws created decades ago were developed when the average household size was larger than today, meaning that a larger population could fit into a smaller number of housing units. Furthermore, there may be interest or need to build mixed-use developments in downtown areas, which is not necessarily supported by the underlying zoning.
- **Infrastructure**: A growing population would put increased pressure on infrastructure, which may necessitate investments, as new residential, commercial, industrial, or institutional development requires utilities, water and sewer, and transportation facilities, etc.

- **Municipal Services**: Similar to infrastructure, a growing population may necessitate investment in emergency services and education – more teachers, paraprofessionals, specialists, and physical infrastructure (e.g. school buildings).
- **Topography**: Many of the communities in this corridor are located in mountainous areas. For example, Orange and Athol have relatively small footprints of their built environment, partially due to the mountains running through them. Therefore, the importance of zoning – and especially zoning for density – is particularly relevant in these areas.

Recommended Next Steps

Stakeholders recognize the importance of and the opportunities for the Northern Tier region to help advance economic and transportation development that benefits the entire Commonwealth. Therefore, a series of next steps should be considered to continue enhancing regional mobility and connectivity.

Funding would be necessary to enact these recommendations.

Continue to improve understanding of travel demand along the Northern Tier corridor, corridor segments, and linkages to key regional destinations

In particular, the analysis identified two important gaps: key drivers of travel demand in the corridor and the New York City travel market to northern Berkshire County.

The potential for passenger rail service (or public transportation more generally) is heavily dependent on the nature of travel along the corridor such as work, medical, personal, and tourism. While the Statewide Travel Demand Model does have information on trip purpose, more granular and current data on travel along the Northern Tier (including understanding whether the COVID-19 pandemic has resulted in any long-lasting changes) would be beneficial.

This could also include a closer examination of traffic along the corridor associated with nearby communities in Vermont and New Hampshire and with academic institutions in the area.
The Albany extension scenario considered travel demand to and from the Capital region, and not the tri-state area around New York City. Understanding this market and how it might be served could significantly affect the potential for service along the western section of the Northern Tier. A variety of service options should be considered, including linkages with the Knowledge Corridor at Greenfield, as well as various options through New York's Capital Region and Connecticut.

MassDOT, in partnership with regional planning agencies along the corridor, could potentially undertake these efforts.

Advance planning efforts at the intersection of economic development needs and opportunities and serving travel demand

The creation of a coordinated economic development strategy for the Central and Western sections of the Northern Tier would provide a platform to realize sustainable economic growth in the region by in part leveraging investment in intercity public transportation. This could entail assessing conditions that have limited growth including land use, zoning, employment opportunities, education, affordable housing, and public infrastructure, as well as early planning for potential station and facility locations and implications for area infrastructure and connections to regional transit authority services.

Entities such as regional planning agencies and economic development organizations could potentially undertake these efforts.

Explore scheduled motor coach service to Northern Tier corridor destinations
Motor coach service can be a relatively low cost means of improving the mobility along the corridor and developing demand for any future rail service. Examples of where it was an effective precursor to implementing passenger rail include the *Downeaster*, for which motor coach service was enhanced a decade before the startup of train service. More broadly, other successful examples of state supported intercity motor coach services include Colorado, with the Bustang network serving key travel corridors across the state, and California's extensive Thruway operation.

MassDOT and its partners could potentially undertake these efforts with positive stakeholder feedback for this recommendation.

Evaluate alternative phasing or implementation strategies
The Working Group and members of the public have expressed interest in exploring avenues for expediting restored connectivity and mobility along the corridor.

Most of the Northern Tier corridor is served by regional transit authorities, with a focus on serving the needs of their immediate service area. In May of 2024, MassDOT awarded a Regional Transit Innovation Grant (RTIG) to a joint effort by Berkshire Regional Transit Authority (BRTA), Pioneer Valley Transit Authority (PVTA), and Franklin Regional Transit Authority (FRTA) which aims to rehabilitate seven buses and operate a commuter bus network to increase regional connectivity between BRTA, PVTA, and FRTA. Such enhancements and further coordination among these services would improve intra-corridor mobility and connectivity, while also offering the potential for improved efficiency.

MassDOT and entities such as regional transit authorities could potentially undertake these efforts.

Evaluate express service between Fitchburg and Boston
With the largest projected volume of traffic occurring between Fitchburg and Boston, implementation of express service between these markets could offer a relatively low-cost option to initiate upgraded public transportation along part of the corridor. Furthermore, if these improvements were undertaken as part of the MBTA Commuter Rail system, it could open access to other sources of funding for capital improvements, such as eliminating the single-track operation through Waltham.

A potential impediment may be limitations on additional train traffic into Boston's North Station prior to replacement of Draw One in Boston. Draw One is a four-track drawbridge that carries MBTA Commuter Rail trains (including the Fitchburg Line) across the Charles River into North Station. The MBTA currently is considering increasing the number of tracks, thereby increasing capacity and operational flexibility. Therefore, if MBTA increases its North Station capacity in the future, the ability to accommodate additional service could be maintained.

MassDOT and the MBTA could potentially undertake these efforts.

Monitor freight use and trends in the corridor to explore needs/opportunities for public investment
Federal grant funding offers potential opportunities to advance improvements along the Pan Am Southern corridor, including needed potential projects such as Hoosac Tunnel renewal, bridge strengthening, clearance projects to allow double-stack service, Ayer intermodal terminal improvements, and investments that may mitigate severe damage from flooding caused by climate

change. Underlying such an effort will be close coordination with Pan Am Southern ownership, and in the context of a coordinated strategy for rail system improvements on the two east west main lines.

MassDOT and its railroad partners could potentially undertake these efforts.

Develop strategies for improving rail connections within the corridor to meet study goals of supporting economic development, transportation equity, and minimizing impacts to public health/environment

A Northern Tier passenger rail service would involve several entities. MassDOT works with FRA, Amtrak, the MBTA, freight railroads and area stakeholders on a variety of projects. A successful strategy to develop a Northern Tier passenger rail service would require all of these entities and groups to communicate and coordinate effectively, as funding and permitting entities look for unified support for projects. Host railroads and operators apply their resources and efforts to projects with credible strategies and plans.

While the metrics show the more effective alternatives, policy decisions and strategy are the required next steps to determine if and how the Commonwealth will proceed. These require, at a minimum, continuing effective communication and coordination across all stakeholders.

The existing Compass Rail plan anticipates enhancing connectivity and transportation equity across the Commonwealth. The connection between Greenfield, Springfield, and Boston is in the implementation stages and could be a mechanism to achieve increased west-east mobility.

MassDOT and its public sector and railroad partners could potentially undertake these efforts.

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NORTHERN TIER PASSENGER RAIL STUDY

- *DRAFT* -

Appendices

Appendices

Appendix A: Public Engagement

Appendix B: Federal Railroad Administration Grade Crossing Inventory

Appendix C: Environmental Resource Maps

Appendix D: Ridership Methodology

Appendix E: Cost Estimation

Appendix F: Benefit-Cost Analysis

Appendix A

Public Engagement

Northern Tier Working Group and Public Meeting Notes Northern Tier Passenger Rail Study Public Comments

Northern Tier Passenger Rail Study Working Group Meeting #1

Thursday, December 16, 2021 1:30-3:00 PM
Held Virtually Via Zoom

Meeting Summary

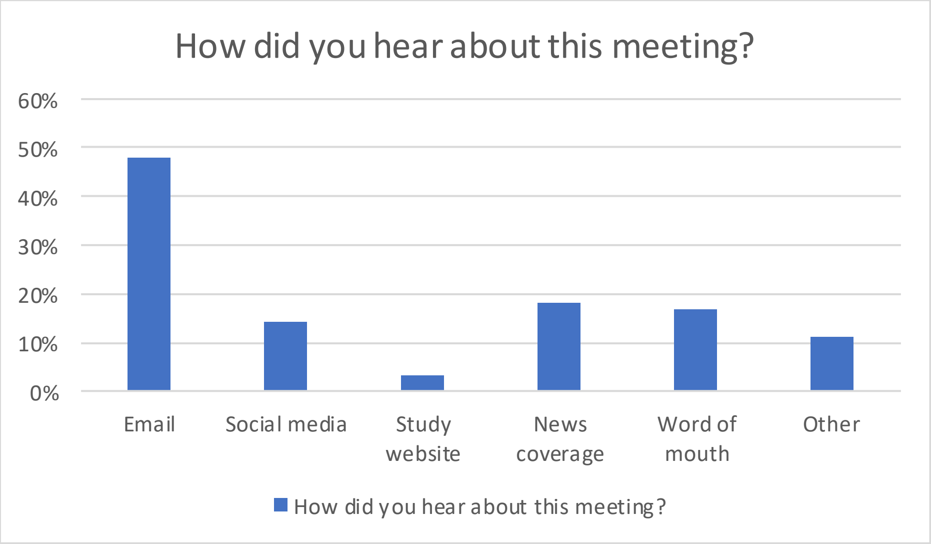
On December 16, 2021, MassDOT conducted the first Working Group meeting for the Northern Tier Passenger Rail Study. At this meeting, the Study team provided an overview of the Working Group purpose and Study background and process. The Study team solicited feedback on the draft Study goals and objectives. The meeting was also open to members of the public, who were given the opportunity to share comments and questions at the end of the meeting after the Working Group discussion.

Meeting Notes

1. *Welcome, Ground Rules and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the meeting and are informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself and explains the ground rules for the meeting including how Working Group members and the public can participate. Makaela Niles (MassDOT) reviews the agenda for the Working Group meeting.

A poll is launched to better understand how meeting attendees learned about the meeting. Here are the results:



2. *Introductions by Makaela Niles (Project Manager)*

Makaela Niles (MassDOT) introduces the Study team including the consultants and their roles. Anna Barry and Paul Nelson (HNTB) are introduced as Project Manager and Deputy Project Manager. Erica Blonde, Leah Epstein, and Lauren Dvonch (HNTB) are introduced as the Public Involvement team. Andreas Aeppli and David Baumgartner (Cambridge Systematics) are also introduced as part of the Study team. The meeting is opened up to Working Group members in attendance for introductions. The following icebreaker questions are used to guide the introductions:

- What is your name?
- What is the organization/institution you are representing?
- What is the one most important outcome you would hope to achieve from a Northern Tier Passenger Rail Service?

Working Group member introductions:

- Mayor Roxann Wedegartner (City of Greenfield): Learn more about plan for the Study and make sure Greenfield is included in the plan.
- Ashley Stolba (Executive Office Housing and Economic Development): Primary goal is to learn more about the project and make sure we are coming to a consensus driven decision.
- State Senator Jo Comerford (Hampshire, Franklin Worchester District): Thanks for the work and assembling a great team to do this Study. Worked with many colleagues to pass the legislation for this study. Most important outcome for this study is robust community engagement. Heard about the desire for robust passenger rail during campaigning and hopes that community can play a role in the development of the Study.
- Glenn Eaton (Montachusett Regional Planning Commission): Curious about how this Study will come out compared to a similar study that was done about 25 years ago.
- Jessie Samwel (Federal Railroad Administration): Here to learn about project and provide help however we can.
- Jody Ray (MBTA): Spent a lot of time working on the Connecticut River mainline which would connect to this corridor at Greenfield. Glad to be able to serve on this committee.
- Susan Templeton (Office of Senator Cronin – Worcester and Middlesex District): District director attending on behalf of Senator Cronin.
- Jonathan Butler (1Berkshire): Important outcomes include better connectivity throughout Massachusetts and the economic benefits that will come with that.
- Josh Ostroff (Transportation for Massachusetts): Goal is more equitable, just, clean, efficient, and modern transportation and all the benefits it provides. Pleased to be a part of this process. Acknowledge legislative partners that have kickstarted this effort. Outcome is credible basis for sustained investment in capital and the operations needed to provide mobility across the state, particularly to underserved regions across the state that do not have interregional connections.
- Linda Dunlavy (Franklin Regional Council of Governments): Hope to achieve outcome of showing how transformative regional rail on this corridor can be for all of Massachusetts.
- Matthew Russett (Office of Congressman Richard Neal): Transportation legislative aide for Congressman Neal. Thanks for having us today.
- State Representative Natalie Blais (1st Franklin District): Thanks to MassDOT and the team for pulling this together today. It's nice to see familiar faces that have worked on rail and transportation issues across the state. Thanks to legislative partners across the region.

Community participation is so important. Looking for maximum output when it comes to how rail can impact climate goals, equity, and economic development goals.

- Mayor Tom Bernard (City of North Adams): Transportation is key to economic development, business development, supporting tourism, cultural and outdoor recreation. Moment, time, and funding is there for us to think creatively and capitalize on opportunities.
- Peter Lowitt (Fitchburg Line Working Group): Learned the importance of organizing with legislators and the delegation. Keeping communities in the loop and active participants in Fitchburg process. Would love to see the Fitchburg line go the rest of the way.
- Robert Malnati (Berkshire Regional Transit Authority): Here to listen and hopefully be able to provide first/last mile service.
- Roy Nascimento (North Central Massachusetts Chamber of Commerce): Positive economic impacts from this project from interconnectivity of the region.
- Thomas Matuszko (Berkshire Regional Planning Commission): Actionable plan and program that brings consistent, affordable, and reliable service to North Adams from points east.
- Tina Cote (Franklin Regional Transit Authority): Looking to see how this is going to connect with regional transit authority and getting people back and forth to Boston. This is a gap that needs to get filled.

3. *Working Group and Study Overview by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) reviews the Working Group role:

- Provide knowledge, expertise, and perspective.
- Attend the meetings and actively participate and engage, while being respectful of others' time and points of view.
- Review information and provide feedback.
- Share information with the organization/institution you represent.
- Serve as conduit for broader public involvement.

4. *Study Background and Overview by Makaela Niles, MassDOT (Project Manager)*

Makaela reviews the Study background, overview, and process including the public meeting schedule. Through Section 84 of the 2020 state budget, the Massachusetts Legislature directed MassDOT to conduct a study of the feasibility of rail access between North Adams and Boston. This conceptual planning study will examine the statewide and regional economic and environmental benefits as well as any associated implementation challenges and identify all necessary improvements to support passenger rail service along the Northern Tier.

The process includes:

- Public Participation – foundation of study and will be carried throughout
- Documenting past efforts
- Market Analysis
- Physical, Regulatory, and ROW ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

Public meetings will take place at key study milestones to solicit feedback from the public. The first public information meeting will be held in the Spring. All Working Group meetings will be open to the public.

5. *Alternatives Development and Analysis Process and Additional Engagement Opportunities by Paul Nelson, HNTB*

Paul Nelson (HNTB) reviews the alternatives development process. The team will be looking at six service alternatives. There will be a two-phase approach to this process. The first phase will look at two alternatives:

1. Minimum build - The level of passenger service possible under the existing rail conditions.
2. Maximum build - The best level of passenger rail service through major investments in the rail infrastructure.

The public will have the opportunity to review the two initial service plan alternatives and provide comments. Feedback will be used to develop the final four service plan alternatives (Phase 2). Beyond the Working Group meetings, there will additional engagement opportunities including public workshops, interactive websites, and a comment and subscription form.

6. *Preview of Study Context, Similarities to the East-West Study and Lessons Learned by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) reviews the study corridor map (spans North Adams to Boston). The MBTA currently operates part of the line from Boston North Station to Wachusett in Fitchburg while freight rail operates west of Wachusett. Team will look closely at right-of-way, restrictions, and considerations for the corridor. Makaela also discusses the similarities to the East-West Passenger Rail Study, which evaluated potential alternatives for providing new passenger rail connections between Pittsfield, Springfield, Worcester, Boston, and intermediate communities. The East-West Passenger Rail Study demonstrated both the importance of increased transportation options and the investments may be required to realize the benefits of new rail service.

7. *Sale of Pan Am Railways by Anna Barry, HNTB*

Pan Am Railways is one of New England's regional railroads and is a 50% owner of Pan Am Southern. Pan Am Southern owns and operates railroad between Fitchburg and the state line with New York. CSX Transportation has petitioned the Surface Transportation Board to acquire Pan Am Railways, and therefore that share of the Northern Tier right-of-way. The decision is currently before the Surface Transportation Board in Washington. Board announced a hearing to be held in January which is virtual and open to everyone. A decision will be issued by April and it will go into effect in May. There may be some shifting circumstances but the study can proceed effectively while the sale process is ongoing.

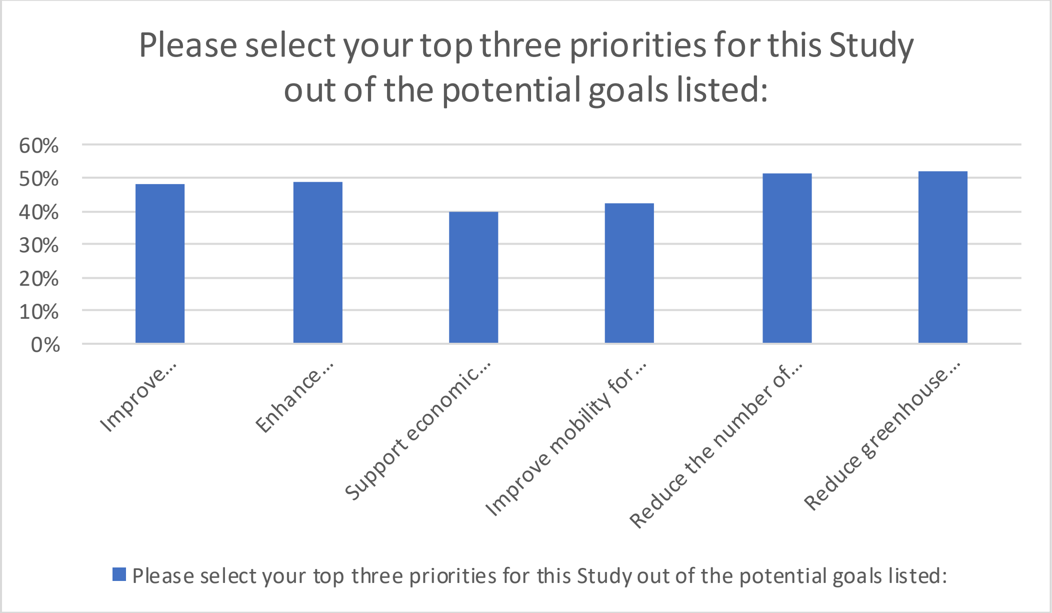
8. *Goals Exercise and Discussion by Makaela Niles, MassDOT (Project Manager)*

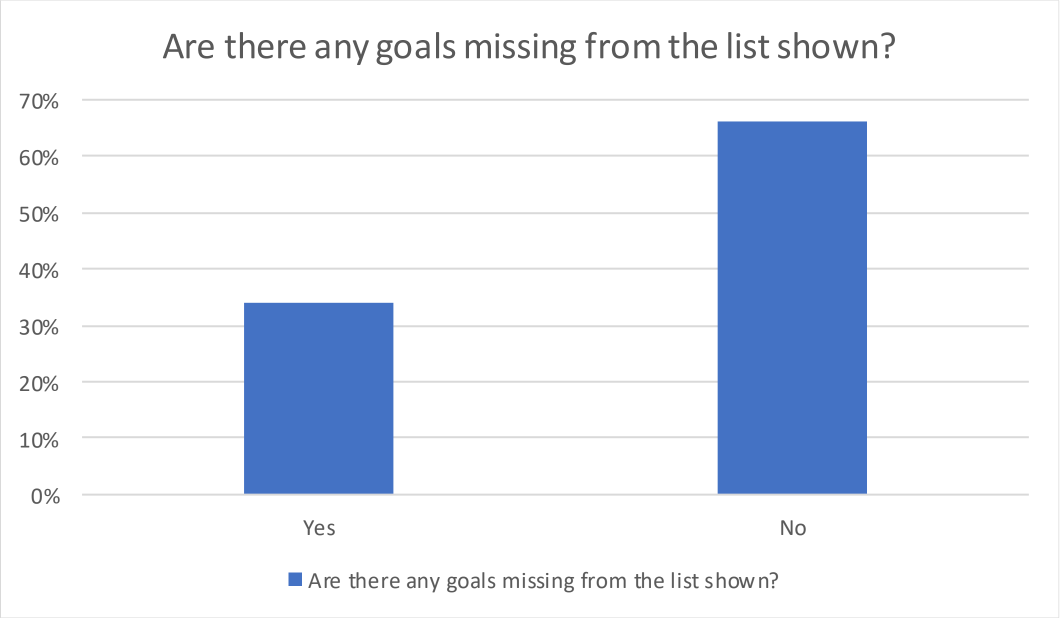
Makaela Niles (MassDOT) reviews the link between goals and potential objectives. A goal is a broad statement of purpose that represents a desired outcome. An objective is a specific action to achieve the overall goal. Goal and objective examples are discussed. The draft study goals are as follows:

- Improve attractiveness of the Northern Tier as an affordable place to live
- Enhance competitiveness for attracting new jobs and employers

- Support economic development for Northern Tier businesses
- Improve mobility for transit-dependent populations
- Reduce the number of automobile trips along the corridor
- Reduce greenhouse gas emissions and air quality impacts from transportation

Two polling questions are launched to collect feedback on the draft goals:





9. *Working Group Discussion on Draft Goals, by Makaela Niles, MassDOT (Project Manager)*

- Mayor Tom Bernard (City of North Adams): There are complementary ideas in the goals listed. We can accomplish all of these things. The last two points relate to climate resiliency.

- Linda Dunlavy (Franklin Regional Council of Governments): If the goal is to only have three goals, there is a way to combine into three very strong goals that would be supported by everyone here.
- Josh Ostroff (Transportation for Massachusetts): Agree with the other two comments. What kinds of programs would best align with future federal funding streams? Something to keep in mind as we evaluate alternatives and start looking at costs.
- Representative Natalie Blais: Transportation connections is something we need to be looking at with other states and other modes of transportation including RTAs
- Josh Ostroff (Transportation for Massachusetts Coalition): Interested to know if we can achieve travel time of 2 hours and 15 mins from Boston to Greenfield that was provided in 1952.
- Linda Dunlavy (Franklin Regional Council of Governments): Paul, can you please re-explain minimum and maximum as it related to the alternative's development process?
  - Paul: Have an existing system west of Wachusett that doesn't serve passenger rail right now (only freight). The rail is in a condition that would only provide service at a certain speed, etc. We understand that benefits and costs is always the tradeoff. We want to see what it would look like if we ran service with the existing condition of the rail (with some minor safety improvements). Once we understand the minimum service that could be provided, then we would take a look at physical infrastructure and find a way to increase speeds on the line and understand how successful investments in the rail would be in growing and driving ridership. This will help define the best- and worst-case scenarios for what service could look like. Then take elements of those scenarios, with feedback from the public, to further define alternatives that satisfy the metrics being looked at.
- Senator Jo Comerford: These goals are very synergistically aligned and with some wordsmithing, we can develop economic housing development goals and a climate resiliency goal. Both minimum and maximum build scenarios would have to serve the goals.
- Mayor Roxann Wedegartner: Is it an either/or approach or is it a plan to transition from minimum to maximum? The 2 hour and 15-minute trip time is fine but I think it would be better if it is under 2 hours but that may be moving toward the maximum if you need higher speeds. Is there any plan now or is that this group's job to see if it's one or the other or some version of the transition?
  - Paul Nelson (HNTB): The ultimate goal is an implementation plan. After the first two alternatives are developed, there are still four more service plans that will be developed. Not necessarily an either/or approach as there are possible interim steps. Maximum benefits will be evaluated by looking at both approaches.
- Representative John Barrett (North Adams): Been involved in this project for over 50 years. Good passenger service and broadband is going to grow the area. One of the few counties in Massachusetts that have lost populations. It is essential for economic development. Possibly reduce the length of this Study, it is too long. This is an easy solution and common sense to have service along this corridor.

10. *Next Steps, by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) presents the next steps for the goals and objectives. An overview of the Study Team Work Tasks is also presented with a timeline. The Study's expected completion date is the Spring of 2023. Makaela asks if there are any closing questions or comments from the Working Group.

- Representative Natalie Blais: How were members of the Working Group determined? If we notice any gaps that could be filled, are you open to adding additional members to the group?
  - Makaela Niles (MassDOT): This group is comprised of federal and state elected officials, regional and local representatives from across the corridor, economic development representatives, and representation from rail industry. Overall the group represents a broad expertise and knowledge base that spans the corridor. MassDOT is open to adding new members to the group, however, all Working Group meetings are open to the public. There will also be public meetings that anyone can attend.
- Senator Jo Comerford: What are the expectations for the Working Group? How many meetings to expect/ when we'll get the materials for the meetings? How will communication with Working Group go? How will MassDOT best work with the Working Group?
  - Makaela Niles (MassDOT): This a tiered approach. We will have these working Group meetings that are open to the public. There will be public and stakeholder meetings as well. We hope to hold meetings in person, but we are cognizant of the changing landscape with COVID. We have our study website where we will add materials and resources. Feel free to email, use the comment form, and attend meetings. Agendas will all align with Study tasks that were shared during this meeting.
  - Erica Blonde (HNTB): Strive to notify at least 2 weeks in advance. If there are materials to review, we will make sure Working Group members have ample time to do so. We will have materials available on the Study website and comment form available 24/7. Please reach out to Makaela or another members of the Study team if one-on-one engagement is of interest.
- Jo Comerford: Feel free to get in the weeds. Is there a way to set meetings well in advance? There was feedback that people wanted to attend but they were not able to because it was set meeting with no engagement whether or not it worked for people. We are ready to engage robustly.
  - Makaela Niles (MassDOT): We aim to be agile with public involvement. Thank you for your comments.
- Thomas Matuszko (Berkshire Regional Planning Commission): Getting the materials posted on the website as soon as possible after the meeting would be most beneficial to the group.
  - Erica Blonde (HNTB): We can consider a notification to the Working Group members when materials are posted to be proactive.
- Peter Lowitt (Fitchburg Line Working Group): What is the level of interaction that we have had with CSX at this point and can we use their acquisition process as leverage to secure any of our goals?
  - Makaela Niles: CSX has been invited to participate in this process. We are aware of their sale process. While both are happening simultaneously, they are separate processes. We hope to continue conversations with our rail partners to communicate our needs and wants with them.

  - Anna Barry: The governance paper of the East-West Passenger Rail Study process on the MassDOT website is informative on the flexibility and leverage you have with a private rail company.

11. *Public Discussion by Makaela Niles, MassDOT (Project Manager) and Erica Blonde, HNTB*

Makaela Niles (MassDOT) opens the discussion to the public and explains the Zoom procedures.

- Deborah Yaffee: I am very concerned about increased diesel fumes /air pollution and also increased noise pollution in my town (Shelburne Falls). There are a lot of home businesses (many healers needing quiet) that are near the crossings where the horns are required to blast. Is there consideration to route the train through another part of town as they did with freight when the Hoosac tunnel was being repaired? I am also concerned how it will impact our real estate taxes here in Buckland and Shelburne and where the stop points will be and the speed of trains coming through.
  - Anna Barry (HNTB): This is a planning study at its earliest stages. All factors mentioned will be evaluated in the development of alternatives. Minimizing negative impacts and optimizing the positive ones is the goal.
- Bob Armstrong: Thrilled with the Working Group. When talking about the goals of the Study, I hope you view climate change mitigation as the most important goal. Decisions about the new train system should be made based of trains running off renewable electricity and not diesel. The other goals related to economic development and affordable housing should be follow-on goals to climate change mitigation. Encourage everyone to watch the movie Don't Look Up.
  - Erica Blonde (HNTB): Thank you.
- General comment: Would trains run on diesel and is electrification a possibility?
  - Anna Barry (HNTB): Team will be looking at a variety of alternatives that deliver travel times in a continuum. When looking at the alternatives it might be determined there is a series of improvements that can be made over time to get us to the optimized service. Could be electrified service or diesel service depending on what the community wants, how quickly, and what the benefits are. Electrification could happen down the line.
- Megan Randall: Live in North Pownal located in Vermont right where the Study corridor crosses the state line from Massachusetts. Some would like to see passenger rail service continue on from North Adams and continue through Vermont to Albany, New York. We in Pownal would like to be part of that. What can we do to show our interest in the expanding the service from Berkshires to upstate New York?
  - Anna Barry (HNTB): Giving input to the Study is important. Local, regional, and state officials should be working with officials from MassDOT to put this type of service on the agenda. This Study may evaluate service to New York (Albany).
  - Makaela Niles (MassDOT): Anna's response is applicable to other comments and questions we received including the regarding service to Williamstown.
- J.B. Mack: I think it's really important to have a goal that the system meets the needs of more than the towns or downtown/village areas adjacent to the rail line. This would imply that the line would be convenient to and support a larger population and that the study

would need to think about multimodal connectivity to the rail line. The rail line will only be as effective and have as much support as the people who have access to the line. Multimodal connectivity is also important for people visiting towns along the line. Once they are dropped off, can they get to their destinations?
  - Paul Nelson (HNTB): This will factor in to how we determine station locations and estimate ridership. We will be looking for connections, both local and regional, to the stations. Want good access to station, regional access to stations. Agree that the more people that view it as a convenient location, the more likely they are to use the service.
- Emily Johnson: Working Group has good representatives from public officials and economic development organizations. Have Native American tribes been contacted to be part of this conversation? Will they be incorporated into the planning process?
  - Makaela Niles (MassDOT): This is our first virtual meeting of the Study; we are still at the early stages. Feel free to reach out with contacts. We are happy to talk to anyone and everyone to engage them as part of the process.
- Anne McKinnon: Not clear what the overall goal of the study is: to establish if rail is the best mobility option or to develop a plan to implement rail service?
  - Paul Nelson (HNTB): Both parts of the question are relevant to the Study. We are ultimately guided by legislative language that was passed and that was focused on the feasibility of rail service. As we evaluate the first two alternatives, we can start to evaluate how those compare to the goals we have developed. There is a feasibility question throughout the process. Once we develop a consensus on a solution, then we will develop a plan on how to achieve it.
- Andy Hogeland: Repeat ideas of going across state borders. Several people from Southern Vermont and Southern New Hampshire that were interested in this Study. Confirm that when you talk about economic development that includes recreation and cultural institutions. Analysis needs to be consistent with the East-West Rail passenger catchment area so we can compare apples to apples on the two lines.
  - Erica Blonde (HNTB): Thank you.
- Mary Westervelt: I don't see rail transportation reducing auto use unless times for travel are comparable to driving. Cost to riders will also be a factor.
  - Erica Blonde (HNTB): Thank you.
- Alex Strysky: In support of this Study. In order to get the public interested and paying attention, it is important to not oversell the project so people don't believe this project is actually going to happen. Don't mean to be skeptical. Good luck to everyone.
  - Erica Blonde (HNTB): Thank you.
- James Starkey: I live in Northern Worcester County on the Route 2 corridor. This area is a HUGE bedroom community for people working east of here that have been priced out of the housing market there. Traffic on Route 2 is awful starting at 5 AM and right through the day. Rail service is badly needed and I am certain it will be used. It's way past time to do this. There was rail service to Gardner back over 20 years ago and it went away. It was needed then and now it's crucial.
  - Erica Blonde (HNTB): Thank you.
- Clint Richmond: Representing Massachusetts Sierra Club. Goals need to acknowledge regional equity. Auto is the only mode of transportation in Western Massachusetts. Goal is

to increase mobility, target population those are reliant on it and those who prefer transit (safer, reliant, and can work while on it). Even diesel train service is better for the environment than autos. Interstate rail connections are important and we expect the study demand modeling will include trips north and south using Amtrak and the Valley flyer. Consider extensions west past Albany.

- Andrew Smith: Hi, I'm a Selectman from the Town of Orange. As you all know, Orange is located in central Massachusetts so it's not necessarily Western Massachusetts or Eastern Massachusetts. Many times, the people here feel somewhat "forgotten". I guess my major hope is that the Town of Orange will be a passenger rail stop here.
    - Anna Barry (HNTB): The legislation that sponsors this study mentions specific cities such as North Adams and Greenfield, however, the study will assess all other stops that should be made in order to achieve the results. The Town of Orange is in the running for potential stations and will be part of the evaluation process.
- Sean Meyer: As part of the market and transportation analysis will potential climate migration trends be factored in? Put another way, with rising sea levels many experts are suggesting that individuals, homeowners and businesses located on the coasts in subject to chronic flooding will need to move inland. How might the analysis best estimate what that might translate into as far as population changes here in Western Mass and possible usage/ridership of this new rail line?
    - Andreas Aeppli (Cambridge Systematics): We are going to be looking at population trends in the region. Working closely with the Donahue Institute which does a lot of examination of populations trends and growth. We may have to rely on existing data and models that have been developed. We will be circling back with you all as the market analysis proceeds.
    - Paul Nelson (HNTB): There is a certain responsibility that this study has to be done within the context of other transportation planning efforts in the state. MassDOT needs to understand how this is prioritized within other needs. A similarity needs to be there in how things are forecasted. Climate change, housing costs, and other factors are pushing people outside of the Boston metro area. There are a few different factors to test and that will be clearly communicated to the public and Working Group so the methodology is understood.
- Bob Armstrong: I would encourage you to consider an additional goal to be reducing automotive congestion in Boston which might mean expanding outlying parking, such as at Alewife or further west so that driving right into the city is avoided.
    - Erica Blonde (HNTB): Thank you.
- Laure Kaye: I hope that part of this effort will be educating the public about the benefits of rail travel for them well in advance of when the extended line will be available. Most people have little interest in switching from private automobile transportation to public transportation except when there isn't any other choice. Will you start on an education component?
    - Anna Barry (HNTB): Part of the public involvement process will include educational materials about rail service. Intent for outreach will be as effective as possible. We will be assessing alternatives for this Study, with securing funding, evaluation of alternatives, and a selection of a preferred alternative to follow. There are many steps of the process in which a constituency will be built at many levels. Public

education will take place at all phases and eventually the service will have to be sold to the people that were originally estimated in the models. Every stage of the project builds with more detailed information.

- Louise Hetzler: Lifelong train buff. I've written many songs about trains and I'd like to offer them to this group as a way to educate people about the joys of train travel. We need this service and need to work on climate change now, electrification should not be an end goal but a starting goal. I am a music educator and have written many train songs while riding the train. Thank you.
    - Response: Thank you, that's a very generous offer.
- Caryl Hull Leavitt: I'd also like to make sure the idea of "increased tourism" is not overlooked for consideration. Our interest in North Adams was very much informed by the idea of the "cultural corridor" described in North Adams' Vision 2030. Perhaps this falls under "economic development" but I think its way to capitalize on increased interest in the area. It's a pleasure to hear of all these very important concerns and perspectives.
    - Erica Blonde (HNTB): Thank you.
- Steve Hayes: Just want to add support to discussion of out of state interest: many of us in Brattleboro and Windham County, VT would be thrilled to see any and all of these build out proposals so close to or even possibly interconnecting with the route serving our community.
    - Erica Blonde (HNTB): Thank you.

12. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) thanks the Working Group and the members of the public for attending and sharing comments and questions, and encourages attendees to visit the website to submit additional comments or questions, or sign up for updates. The materials from this meeting will be made available on the Study website. Look forward to reconvening in the New Year.

Northern Tier Passenger Rail Study Meeting #1 Attendees

MassDOT/Study Team:

- Makaela Niles – MassDOT
- Anna M. Barry – HNTB
- Paul Nelson – HNTB
- Erica Blonde – HNTB
- Leah Epstein – HNTB
- Lauren Dvonch – HNTB
- Andreas Aeppli – Cambridge Systematics
- David Baumgartner– Cambridge Systematics

Working Group Members & Alternates:

1. Ashley Stolba – Executive Office Housing and Economic Development
2. Cameron Lease – Office of State Senator Jo Comerford

3. Corinne Coryat – Office of State Representative Natalie Blais
4. Elena Cohen – Office of State Senator Jo Comerford
5. Glenn Eaton – Montachusett Regional Planning Commission
6. Jared Freedman – Office of State Senator Jo Comerford
7. Jessie Samwel – Federal Railroad Administration
8. Jo Comerford – State Senator
9. Jody Ray – MBTA
10. John Barrett – State Representative
11. Jonathan Butler - 1Berkshire
12. Joshua Ostroff – Transportation for Massachusetts
13. Linda Dunlavy – Franklin Regional Council of Governments
14. Matthew Russett – Office of U.S. Representative Richard Neal
15. Mayor Roxann Wedegartner – City of Greenfield
16. Mayor Tom Bernard – City of North Adams
17. Natalie Blais – State Representative
18. Peter Lowitt – Devens Enterprise Commission
19. Robert Malnati – Berkshire Regional Transit Authority
20. Roy Nascimento – North Central Massachusetts Chamber of Commerce
21. Susan Templeton – Office of State Senator John Cronin
22. Thomas Matuszko – Berkshire Regional Planning Commission
23. Tina Cote – Franklin Regional Transit Authority
24. Travis Pollack – Metropolitan Area Planning Council

Public Attendees:

1. Abigail Cutrumbes
2. Adam Frenier
3. Adrienne Nunez
4. Alec Wade
5. Alex Strysky
6. Alice Bradley
7. Allen Pope
8. Amanda Nash
9. Andrew Achenbach
10. Andrew Smith
11. Andy Daly
12. Andy Hogeland
13. Anne McKinnon
14. Anthony Jewell
15. Ben Heckscher
16. Benjamin Craig
17. Benjamin Lamb
18. Beth Girshman
19. Bob Armstrong
20. Brad Harris
21. Brian Domina
22. Bruno Fisher
23. Caleb White
24. Caryl Hull Leavitt
25. Charlotte Minsky
26. Chris Klem
27. Clete Kus
28. Clint Richmond
29. Colin Bratton
30. Dan Hodge
31. Dan Peacock
32. Dana Roscoe
33. Daniel Morrissey
34. Danny Jin
35. Daryl Amaral
36. Deborah Yaffee
37. Doc Pruyne
38. Edie Heinemann
39. Emily DeVoto
40. Emily Johnson
41. Enrico Grillo

42. Eric Buddington
43. Eric Smith
44. Ethan Britland, MassDOT
45. Geoff Kravitz
46. Holly Rueger
47. J. B. Mack
48. Jacquelyn Goddard, MassDOT
49. James Starkey
50. Jay DiPucchio
51. Jerry Lund
52. Joe Kurland
53. John Garrett
54. Joseph Dever
55. Joseph Ort
56. Joseph Pagano
57. Kate Wilkinson
58. Katie Stetner
59. Kevin Pink
60. Kim Robinson
61. Kristine Gorman
62. Laura Kaye
63. Louise Hetzler
64. Lucia Foley
65. Marco Turra
66. Mark Maloni
67. Mark Shapp
68. Mary Holtorf
69. Mary Westervelt
70. Mary-Ann Palmieri
71. Maureen Mullaney
72. Max Hartshorne
73. Max Pavlov
74. Megan Randall
75. Michael Perreault
76. Michael Tripp
77. MJ Adams
78. Nick Mellis
79. Patrick Beaudry
80. Paul Goodrich
81. Paul Tuthill
82. Rich Rydant
83. Richard Nathhorst
84. Rob Culliford
85. Ronald Coler
86. Sarah Bradbury
87. Sarah Robertson
88. Scott Baker
89. Scott Darling
90. Scott MacDonald
91. Sean Meyer
92. Shaun Suhoski
93. Sinait Sarfino
94. Steve Hayes
95. Susan Conger
96. Walker Powell
97. Walter Ramsey
98. William Perry
99. William White
100. Zane Lumelsky

Northern Tier Passenger Rail Study Working Group Meeting #2

Wednesday, June 22, 2022, 1:00-2:30 PM

Held Virtually Via Zoom

Meeting Summary

The Northern Tier Passenger Rail Study Working Group met for the second time on June 22, 2022. At this meeting, the Study team provided an overview of the updated Goals and Objectives for the Study, information from prior Studies, the current conditions of the corridor, and next steps for the Study. The meeting concluded with a discussion of issues and opportunities for consideration during the Study. The meeting was also open to members of the public, who were given the opportunity to share comments and questions at the end of the meeting.

Meeting Notes

1. *Welcome, Ground Rules and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the meeting and are informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself and explains the ground rules for the meeting including how Working Group members and the public can participate. Makaela Niles (MassDOT) reviews the agenda for the Working Group meeting.

2. *Study Overview and Summary of Working Group Meeting #1 by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) explains the Study overview which includes the following:
- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory, and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

The Study team presents the proposed set of goals and objectives for the Study and describes how feedback was used to update and refine the goals to include the following:
- Support economic development along the Northern Tier corridor
- Promote transportation equity
- Minimize impacts on public health and the environment from transportation

3. *Review of Past Efforts by Paul Nelson, HNTB*

Paul Nelson (HNTB) reviews the past efforts. The Study team has reviewed 25 past efforts including passenger rail and transportation studies, municipal transportation plans/studies, and economic development studies. The Study team has also identified information related to demographics, rail infrastructure conditions, environmental resources, travel patterns and/or trends, as well as future conditions.

The key takeaways of this include the following:
- No previous corridor-wide evaluation of travel conditions along Route 2
- Most transportation planning has been focused more on local travel
- Opportunity for passenger rail service to tie into economic development efforts throughout the Study area
- Need a better understanding of travel pattern changes due to COVID-19

4. *Current Conditions: Market Analysis by Paul Nelson, HNTB*

Paul Nelson (HNTB) reviews the corridor demographics (i.e., population, cost of living, zero car households and poverty levels, employment and economic development, tourism and major attractors, and the 2020 to 2040 socio-economic forecasts) and gives an overview of the overall travel patterns and travel by vehicle.

Paul Nelson (HNTB) notes the following from the demographic data:
- All data represents pre-COVID conditions (2019)
    - Full impact of COVID on society and travel patterns is still not fully understood
    - Study team will be monitoring trends tied to commuting patterns, other travel patterns, employment trends, etc.
- The Study team is using most current MassDOT-approved population and employment forecasts by UMass Donahue Institute
    - Updated forecasts that incorporate the 2020 Census and potential COVID impacts are in development

Paul Nelson (HNTB) highlights the following from the travel patterns overview:
- Motor vehicles are the predominant mode of travel, especially west of I-495
- Most travel in the corridor is local (same county or adjacent)
- Travel volumes along Route 2 have grown closer to Boston but stagnated farther west
- Travel options beyond motor vehicle are limited west of Fitchburg

Market Analysis: Findings & Conclusions
- Lack of transportation options
    - Intercity travel choices west of Fitchburg are limited outside of personal vehicle use
- No unified corridor travel behavior
    - Trips leaving each segment more likely destined to communities outside the Route 2 Corridor
- Population and employment declines expected to decrease travel demand from Worcester County westward

  - Based on current projections, underlying demographic dynamics could reduce major growth in these areas of the corridor

5. *Working Group Discussion on Current Conditions: Market Analysis by Paul Nelson*

Paul Nelson (HNTB) asks Working Group members for feedback on the goals and objectives. He asks what attendees see as the most important for planning passenger rail service, and if the Study team should look at any additional data in more detail.

Representative John Barrett comments that the aging population and loss of younger workers may reduce the employment pool. He asks if this will be an attraction to younger people coming to the area to look at some of these jobs.

Paul Nelson (HNTB) says that is the ultimate question. He notes that this will be one of the things that the Study team is looking at, especially with the addition of rail service for new transportation options. He speculates that it is more likely to see people moving into these areas who have jobs in other parts of the corridor and then use the rail service to connect with it, and that would almost happen first before big changes would be seen in the underlying employment and job market. He says the Study team can work with folks who represent those types of economic development agencies in the corridor and try to understand in fine detail how that is implemented throughout the corridor.

Representative John Barrett responds that one of the biggest draws Western Massachusetts has always had is the quality of life, and with technology and broadband improving all the time and more people working remotely, this can relieve the pressure on larger cities. He says that this would be an asset for the area with rail service becoming available. He does not know how in depth the Study team has gone looking at this, but says everyone has heard that “everybody is moving west”, and asks if this would be an enhancement of any kind? He thinks it would be, but just takes it as a selling point. He notes that as more people move west, it is a question of getting them to move even farther west than Fitchburg and Leominster by using rail service as a selling point.

Paul Nelson (HNTB) says that the Study team will be looking at models. He explains that a lot of the growth models for Massachusetts start in Boston and grow out, and the further you are away, the longer you have to wait for it. He mentions that the Study team will also be looking at the opportunity and how feasible is it with something like a rail that might start a different growth pattern.

Representative John Barrett says that just by taking a look at what has been done, it has improved and created growth in Fitchburg because of rail service there. He speculates the same thing will happen into further areas like Franklin and Berkshire, and even into other counties out west with extended rail service.

Makaela Niles (MassDOT) reads a comment from Representative Blais, who says “To echo your point, it’ll be important to understand how rail will incentivize economic development.”

Peter Lowitt (Devens Enterprise Commission) says that there has been explosive growth in Devens over the last two years. He is not sure if that would have been captured in the data because it is based on the 2020 ACS. He notes that Devens has added close to 2 million square feet and north of 6,000 jobs and people are hiring like crazy to fill up the buildings that are being constructed. He asks if the Study team will be able to refine the Study to take that into account as it moves forward.

Paul Nelson (HNTB) says that this will absolutely be taken into account. He explains the Study team will be thinking in depth about how this service can connect with the opportunities that are there, so the more information the Study team can find about existing travel patterns to Devens and how likely people are to switch over, the better. He says from what the Study team has learned, Devens is a unique location in the Commonwealth as far as the land available and opportunities for expansion there.

Linda Dunlavy (Franklin Regional Council of Governments) asks if Paul can talk a little bit about how the economic potential of rail in western Massachusetts will be assessed? She also notes that a huge development in western Massachusetts that will not be captured by current data is bringing broadband to so many western Massachusetts communities and to home networks, and she wonders how that will be built into the analysis.

Paul Nelson (HNTB) says that as far as economic potential, the Study team includes the UMass Donahue Institute, and this is the thing the Study team is going to explore. He says the simplest way to think about economic development is a continuation of existing patterns and that kind of propagation of commuters being further west if you can decrease their travel time. He thinks that is going to be the starting point for it and notes that the Study team would have to look at areas where stations may be, so looking at Greenfield or North Adams and saying ‘organically, what’s going to happen? What is going to change about how people think about travelling here’ and ‘what models can we do to reasonably anticipate that’? He says that maybe the Study team could work with them to get information about people who are currently traveling and to start to find the right information for a good estimate of what might happen. He says the Study team is also going to be working with two prevailing things: the existing population that is aging and starting to retire, and that’s a big part of the population, but there is always the opportunity for other people to come in and fill that. He wonders if the ability of the rail services will be an equal match to that or will one kind of prevail over the other? He also says the broadband is going to be a big part of why people relocate, and the Study team will also be asking about the ability to work remotely as one key drivers of where people choose to live and how much of that is of access compared to other things. He says that just thinking of families with school children and in the school system – are they more or less likely to move just based on the availability of broadband and the ability to work remotely? He thinks it is something that everybody is looking at through COVID and the Study team will look at all the different factors that play into that. This could be shared with the group and once we get data.

Representative John Barrett says that last week he had a trip of 3 hours and 45 minutes getting into Boston. He says Route 2 is worse than what it was in the pre-COVID era and as time goes on, the traffic is heavier. He says what is very correct in all of this is that it’s moving further west, noting that it has gone from Fitchburg into Leominster and out to Gardner now, and anyone who travels and uses the route on the Mass Pike that cuts down I-91 and comes up on the Mass Pike is finding it more brutal. He asks how this is impacting the environment and the carbon impact of all these cars piling up more and more all the time. He thinks this must be taken into consideration and says it is now worse. He does not know what the numbers are showing to get into Boston from the western part of the state and does not care what area people are coming in from, whether it’s Worcester or Berkshire County, or even southern Vermont for that matter. He says he does not know if that is a question or statement of fact more than anything else.

Paul Nelson (HNTB) says he thinks that when the Study team looked at it, it was only 2019 versus 2021 data. Based on his own travel experience, it is the year 2022 when the Study team has really seen things significantly ramp up as far as delay and travel time changes and things like that. He says the Study team can try to find ways to see how things have changed from 2021 on as far as congestions and travel times.

Representative John Barrett says that if you're not out of the city by 1:45pm at the latest you run into three plus hours going into his area.

Makaela Niles (MassDOT) reads a comment from Representative Blais, who mentions that the Massachusetts Office of Travel and Tourism is using similar LBS data so it might be helpful to coordinate with them. She thanks Representative Blais for the comment and says that the Study team will certainly coordinate with them.

6. *Current Conditions: Ownership, Operations, Right-of-Way by Anna M. Barry, HNTB*

Anna M. Barry (HNTB) explains that as of June 1st, CSX has acquired Pan Am Railways (PAR). She notes that Pan Am Railways' 1,200-mile rail network through New York, Massachusetts, Connecticut, Vermont, New Hampshire, and Maine is now part of CSX's much larger 21,000-mile network, serving the eastern United States and parts of Canada. She mentions that CSX assumes PARs half ownership of the Pan Am Southern LLC (PAS) and that PAS is a separate railroad jointly owned with Norfolk Southern that operates freight service from Ayer, MA into Vermont and New York State, however PAS owns the right-of-way between Fitchburg and North Adams. She explains Pan Am Southern/ Pan Am Railway operations on the Northern Tier consist of about 10 trains daily and dispatching responsibility does not always align with ownership. PAS performs dispatching on MBTA-owned stretch from Ayer to Fitchburg and the MBTA has the right to assume dispatching responsibilities under some circumstances. She references several maps that show ownership, maintenance, and dispatching along the track, as well as the class of railroad track and allowable speeds. She notes that ruling grades are uphill grades that impose limits on the weight and size of a freight train, meaning this may require operation of lighter and more frequent freight trains, while heavier trains are slower on uphill grades, and both have an impact on passenger rail service. She also notes that there are 78 total active grade crossings, explaining that active warning devices typically include flashing lights and potentially gates, whereas passive warning devices typically include railroad cross-buck signs, stop signs, and other warning devices that alert a driver or pedestrian that a grade crossing is present.

Ownership, operation, right-of-way: Findings and Conclusions

- Track, structures and signals could support passenger service
    - The track, structures, and signals that allow a given class of track and freight train speeds generally allow for passenger train speeds that are higher than freight speeds
    - The maximum authorized speed on a section of track may be reduced in some areas because of curvature, grades, and approaches to meeting points on single track
    - Significant sections of single track reduce the capacity of the railroad and reduce flexibility for passenger train schedules
- Existing handoff between passenger and freight dispatching has been a successful model. CSX acquisition of Pan Am Railways may bring benefits (shifting trains to Boston and Albany (B&A)) and drawbacks (new shared ROW requirements)

7. *Working Group Discussion on Current Conditions: Ownership, Operations, Right-of-Way by Anna M. Barry, HNTB*

Anna M. Barry (HNTB) asks the Working Group members if any of this information aligns with the Study goals and objectives, what Working Group members see as the most important factors for planning passenger rail service, and if the Study team should look at any additional data in more detail.

Makaela Niles (MassDOT) reads a comment from Thomas Matuszko, who says “it may be too soon to know, but with the CSX acquisition, has CSX indicated that they intend to use this line? For instance, might CSX consolidate the line through Pittsfield and Springfield?”

Anna M. Barry (HNTB) says that the transaction that was approved by the Service Transportation Board includes a commitment by CSX to allow Norfolk Southern to operate one of its higher speed trains on that Boston and Albany (B&A) track. This the only commitment that the Study team is aware of that was in the public record and there is no outward indication now of what types of changes, if any, might be made on the Pan Am Southern. It is important to remember Pan Am Southern has two owners, one is the Norfolk Southern and the other is CSX and they are both co-equal owners of that stretch of railroad. She says the Study team does not know yet if they’ll put their heads together and how they will, or if they will, restructure the freight service.

Thomas Matuszko (Berkshire Regional Planning Commission) asks if there is a time frame of when these decisions get made with these types of transactions.

Anna M. Barry (HNTB) says that she does not believe there was a time frame for the change of that freight train that is specific to moving to the B&A, but Norfolk Southern may have an interest in doing that, so they would have an incentive to make that move as soon as they could. She says that as for the rest of the changes, there isn’t a time limit, and it would be up to the individual companies to determine how fast they want to move.

Andreas Aeppli (Cambridge Systematics) comments that Norfolk Southern must actually complete some construction in New York before they can move that train, so it is really not clear when that is going to happen. They have not started construction yet.

Makaela Niles (MassDOT) reads a question from Representative Blais who says, “I heard that somewhere along the way that the line has an updated signal system west of Wachusett and is there any truth to that?”

Anna M. Barry (HNTB) responds that the Study team had understood that Pan Am Southern had committed to the implementation of positive train control, which is an enhanced safety system for stopping trains short of collisions and other factors. She explains the Study team was not able to confirm that it had been installed but there was an intent to do it and they will certainly be looking to find out if that has occurred. Anna says she is glad that was mentioned because it is another move in the right direction.

Makaela Niles (MassDOT) reads a question from Peter: “Is there any new train technology that might impact the Study that we might be aware of?”

Anna M. Barry (HNTB) says that this positive train control is a requirement by the federal railroad administration for most areas where you operate passenger trains. She explains that it is not really new technology, but it is a recent requirement in the last ten years, so that is something the Study team will definitely factor into the consideration of alternatives. She does not think they are what you call new technology, but this railroad could potentially benefit from, depending on what is looked at, tilt trains or other new features that are not new for providing higher speed services.

Representative John Barrett says he thinks the most important thing the Study team has answered is that it does support passenger service. He says he put in the transportation bill last night knowing full well that it won't go the level that he asked for, but he asked for $35 million to address two areas of concern here. He says the big elephant in the room, of course, is the condition of the Hoosac Tunnel from Florida and into the city of North Adams, which is critical to getting to the destination of Vermont and New York and to upgrade the lines along the way to deal with some of the things that were talked about with the curves and the grades of some areas because he thinks that needs to be looked at. He says that one of the reasons he submitted the bill is because in a time when there is money available to address real needs, of course they would push very hard for what they call the 'west to east railroad' and the 'east to west line' in the southern part of Massachusetts, beginning in Pittsfield. He thinks that, hopefully, they will be able to get some money over the next couple of years, or at least into the bond issue so that money is available. He says that everyone knows that this is play money that goes in there but aims to get it released and get a commitment from the new governor. He explains that this governor has made a commitment to rail service, but he's going to be gone, so he hopes that the next governor will deal with the issue of putting some money into this. He thinks there will be sufficient support with the western Massachusetts delegation, especially those in the Northern Tier areas and that they would be able to get some money in there. He does not know if it will be $35 million but says back in 1851 the legislature in the state of Massachusetts committed $1 million to the construction of the Hoosac Tunnel and 22 years later, it ended up spending $21 million. He says to imagine what that investment would be in real dollars today. He is sure it would be in the billions of dollars, so he did not think $35 million was too much to ask for. He also says they must continue to press for that, and he is sure the delegation in the western part of the state would do so. He explains that is just an informational type of thing because they need to look at the Hoosac Tunnel and some minor changes along this route to get passenger service working and would need the cooperation of CSX and others and to think about some of the commitments they made to the STB board in their comments.

Anna M. Barry (HNTB) thanks Representative Barrett for the comment and says that while it was said that it would support passenger service, it was not said that it was competitive or high-quality service. Anna says she has a Hoosac Tunnel mousepad, which shows that it is a long stretch of single track in poor condition even on a mousepad, so she thinks it still needs investment.

Representative John Barrett says that he thinks the thing to remember here is there is a historical perspective to this also. He thinks it's the longest tunnel in the United States for train service, or that is what people used to say, and it used to be the longest in North America, so there is a lot of historical perspective to this rail line and doing these types of things, so hopefully it will work, and they will try anything.

8. *Issue and Opportunities Discussion by Anna M. Barry, HNTB*

- Current conditions and issues simultaneously present potential opportunities and constraints, including the ownership of the corridors and the state of the right-of-way infrastructure
    - CSX Acquisition may shift trains to B&A and may impose drawbacks such as new shared right-of-way requirements

  - The current right-of-way could support passenger service, but it has been maintained for freight service with grades, curves, and single track that could limit the quantity or raise the cost of good passenger service
  - Existing handoff between passenger and freight dispatching on the Northern Tier has been a successful model, but new ownership may change the model
- Many passenger train station locations may be able to host new stations
- Existing governance, regulatory and funding structures could support Northern Tier passenger service, including Amtrak access rights on freight railroads
- A new state Western Massachusetts Passenger Rail Authority could promote development of new passenger services

9. *Working Group Discussion on Issues and Opportunities by Makaela Niles, MassDOT (Project Manager) and Anna M. Barry, HNTB*

Anna M. Barry (HNTB) opens a discussion on what Working Group members see as the primary constraints, things that should be considered, opportunities, and other potentially helpful data sets for the development of alternatives.

Thomas Matuszko (Berkshire Regional Planning Commission) comments that it would be very important to try to get some empirical data to determine the shift in employment patterns and work-life patterns to rural areas to justify the “build it and they will come” or “they’re already coming, and they need a way to get to the other urban areas.” He thinks this data set would be crucial to the Study moving forward.

10. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) presents the next steps for the Study goals and objectives. Up to six service alternatives will be developed and evaluated through the Winter of 2023 and the Study is expected to be completed in the Spring of 2023. She explains that the first public information meeting is anticipated to be held in July and the next Working Group meeting will be held later this summer and formal meeting announcements will be available through a few different channels including the Study website, social media, and email. She asks if there are any questions or comments from the Working Group and the public.

11. *Public Discussion by Makaela Niles, MassDOT (Project Manager), Anna M. Barry (HNTB), and Paul Nelson (HNTB)*

Makaela Niles (MassDOT) opens the discussion up to members of the public in attendance for public comment. She reminds attendees to use the raised hand button to participate verbally and that they will receive a notification on their screen to unmute once they are recognized. She says that the question-and-answer (Q&A) box can be used to submit written comments and questions and ask the attendees participating by phone to dial star-nine (*9) to raise a virtual hand. She asks that people share only one comment or question at a time and limit comments to two minutes so the Study team can hear from as many people as possible about their thoughts on issues and opportunities that should be considered during the development of the potential service plans and alternatives. She clarifies that this is certainly not the only opportunity to comment, and that comments and questions can be shared throughout the Study process using the comment form on the Study website. She notes that there are several questions and comments that have come in over the course of the meeting in the Q&A.

Jay Flynn asks if some of those studies are available.

Makaela Niles (MassDOT) says the answer is yes. She explains that as Paul mentioned, there were several transportation studies and economic development studies that were reviewed as part of this process, which included the Intercity Passenger Rail Governance White Paper that was conducted following the east-west passenger rail process and is available on the MassDOT website as well as the state rail plan and freight plan. There were also some regional transportation studies that were reviewed as well, so she recommends reaching out to regional planning agencies or visiting their websites for some of those efforts or to learn about some of the great work they're doing.

Greta Jochem asks if there were speed maximums on the map of the tracks going across the state. She asks if there is an estimated time for how long it would take to get to North Adams or to Boston for that whole stretch of tracks because it looks like some of the maximum speeds were 30 or 35 miles an hour. She also asks if there is an estimate and asks where she can find more information on who is part of this Working Group.

Anna M. Barry (HNTB) responds that the estimate has not been developed yet. That will be happening as the Study team starts to evaluate various service alternatives and those speeds just tell you in a given segment what the maximum is, it does not tell you what the actual speed is throughout a given segment. She explains that is they cannot just add those up and come to a number, so the Study team doesn't have it now, but it is something that will be developed in the next tasks.

Makaela Niles (MassDOT) says this is another great question and a great time to plug the Study website where we have meeting materials and information on the website about the Study, including a list of working members. She thanks Greta for those questions and says the next question in the Q&A comes from James.

James Starkey thinks the data showing population growth in Central MA is "declining" along the Route 2 corridor is incorrect. Towns west of I-190 on Route 2 have seen rapid population growth as far west as Athol and Orange.

Paul Nelson (HNTB) responds that there is two parts to that. Part of it is what the Study team has seen in recent history, say like the 2010 to 2020, and he believes that information showed growth in the central segment. He clarifies that the current projections out to 2040 do show little to declining growth. He says that perhaps as those projections are revised, the Study team might see something like the growth you mentioned factor into it. He says the Study team can make sure to specifically look at those towns to see how it's related to that and explains that one that might be incorrect before he thanks James for drawing that to the Study team's attention.

Chris Klem asks if the Study team will develop projections for population, cost of living, and other social/economic/demographic factors that may shift if passenger rail is developed.

Paul Nelson (HNTB) explains there is two parts to the answer on that. For consistent planning throughout the Commonwealth, the Study team has a responsibility to look at the future conditions that are approved i.e., population, household, jobs, number of jobs expected in each MPO or each region and kind of making they are consistent with that. He does not think that is going to stop the Study team necessarily from testing the things that might change and how they may deviate from that. Right now, the Study team has not established what future conditions will be tested in these ridership models for the evaluation of service alternatives. He notes that that is a good question and something the Study team will be asking as it is put together is ‘what is the responsible way to ensure consistency with statewide planning standards of practice?’ and then recognizing the potential for transformational changes in how people settle and move around that something like this could do. He notes the Study team is committed to defining how this is talked about and how it will be considered since that will be a big part of the dialogue the Study team wants to have, both with the Working Group and the public, on how that will be done moving forward.

Makaela Niles (MassDOT) thanks them and says the next question is from Travis.

Travis Pollack (Metropolitan Area Planning Council) asks if there are any intercity bus options in this corridor, and what is ridership for those services like.

Paul Nelson (HNTB) responds that there is no actual contiguous service along the Route 2 corridor. He says there is bus service at key points, but it doesn’t run along Route 2. He says the bus service in the corridor is more sporadic like the bus that visits Williams College and then goes down to New York City and that there is service from Greenfield, but one would have to connect to Springfield to get over to Boston. He explains there is nothing there and there is no ridership the Study team can share, but notes that several years ago, there was a service supported along part of the corridor. The Study team has not been able to get data on this, will be able to share it once it is available.

Andreas Aeppli (Cambridge Systematics) says that Paul is right. He explains that the last time there was service on Route 2 from Boston out to Williamstown was about 25 years ago and the state’s project only lasted a couple of years, so it never really had a chance to fully develop a ridership market.

Makaela Niles (MassDOT) thanks them for their questions and responses. She says that speaks to a question that came in from Rauley, who asked about existing RTA bus ridership and how that’s included into the demand forecasting and some of the OD travel patterns. She asks Paul to talk about that component of it and how some of the RTA bus ridership would be factored either into the StreetLight data or into some of the upcoming analysis for ridership or directions.

Paul Nelson (HNTB) responds that it has. He explains that any sort of transit ridership is a good test of how the underlying demographics are translating into travel by alternate modes, so the Study team will definitely be looking at the ridership in the routes that do exist along the corridor, the kind of ridership they are attracting, and work with team members at Cambridge Systematics and other elements of the Study team to see what that shows as far as predicting or estimating ridership and how that might translate over to rail travel as well.

Makaela Niles (MassDOT) says the next question is from Joe. She says that Paul or Anna can talk about the development of the service alternatives and the process the Study team will go through with that including any additional stops along the corridor.

Joe Kurland comments he is glad that Williamstown is included as a place with a major attractor. He asks if that means extending train to Williamstown rather than North Adams is being considered?

Anna M. Barry (HNTB) says the Study team is developing overall six alternatives for this Study and where the trains will stop and where the limits are is certainly open for discussion. She explains the legislation that sponsored this Study specifically mentions Greenfield and North Adams, but she thinks the Study team needs to look at any destination that has the potential to add to the utility and usefulness of the service.

Makaela Niles (MassDOT) thanks them for the question and response. She says the Study team is running a little bit low on time, and that there are a couple more questions in the Q&A to address before transitioning to some of the closing statements.

Rauley Caine asks how the group plans to adjust for the correlation between the decrease in job growth/employment opportunity in the western segment and the lack of currently available travel options?

Paul Nelson (HNTB) says the lack of options is something the Study team will be looking to address directly as far as how passenger rails can fill a gap and the ability to move around. He doesn't necessarily think they are going to be testing the connection between the two direct links but will look at both and how they factor into ridership and service development of the potential alternatives. He explains the idea being that, like the question have been, job growth and employment is on a projected trajectory. Could rail service change it in any way? He says the idea is that by introducing that travel option, does it change who can access those jobs and who wants to access those jobs, and vice versa, how much of the jobs and economic activity in say, the eastern section, could be connected in a way that was not really favorable before?

Makaela Niles (MassDOT) thanks them both and says she sees a question from Representative Blais, and thinks it speaks to what Anna mentioned about stopping patterns since Representative Blais also mentions coordination with New York about ridership to Albany and how this is something that could be looked at. She asks Anna if there is anything else to add to that?

Anna M. Barry (HNTB) says the Study team has not looked at it as part of today's existing conditions but as alternatives are developed, it is something that the Study team can do.

Makaela Niles (MassDOT) says the next question comes from Jay.

Jay Flynn asks if the Study team is looking at N-S connections to Pittsfield/Springfield/Boston or only PAS service.

Anna M. Barry (HNTB) says studying this corridor is quite a substantial effort. She explains that the Study team is not engaged in a specific study of passenger rail on those corridors, but the sources of ridership, the connections of the last mile, as well as the coordination of connections, so meaning the Valley Flyer, meaning any service that might be running in the Berkshires and other locations, meaning RTA services, will be something that will definitely be considered in the development of alternatives and evaluation.

George Kahale comments that there is a bus service between Athol and Gardner connecting to the MBTA at Wachusett station, so there is a service between Greenfield and Athol. He explains that this means there is a bus service between Greenfield all the way to Gardner and to Fitchburg, and from there it can be connected to MBTA to Boston.

Anna M. Barry (HNTB) says that the Study team has documented those connections in the Study of current conditions as well.

Makaela Niles (MassDOT) thanks him for mentioning those services.

12. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) thanks the Working Group and the members of the public for attending and sharing comments and questions and encourages attendees to visit the website to submit additional comments or questions or sign up for updates. The materials from this meeting will be made available on the Study website. Looking forward to reconvening later in the summer.

Northern Tier Passenger Rail Study Meeting #2 Attendees

MassDOT/Study Team:

- Makaela Niles – MassDOT
- Anna M. Barry – HNTB
- Paul Nelson – HNTB
- Lauren Dvonch – HNTB
- Sara Stoja - HNTB
- Andreas Aeppli – Cambridge Systematics

Working Group Members & Alternates:

1. Jody Ray – MBTA
2. John Barrett –State Representative
3. Kali Puppolo – Office of State Representative John Barrett
4. Linda Dunlavy – Franklin Regional Council of Governments
5. Matthew Russett – Office of U.S. Representative Richard Neal
6. Marco Turra – CSX Transportation
7. Natalie Blais – State Representative
8. Peter Lowitt – Devens Enterprise Commission
9. Rachel Klein – Office of State Senator Joanne Comerford
10. Thomas Matuszko – Berkshire Regional Planning Commission
11. Travis Pollack – Metropolitan Area Planning Council

Public Attendees:

1. Anthony Jewell
2. Barry Libman
3. Ben Heckscher
4. Carl Seppala
5. Cedric Ye
6. Chris Klem, MassDOT
7. Clete Kus
8. Cole Czub
9. Dan Hodge
10. Danielle Letourneau
11. Ethan Britland, MassDOT
12. Ethan Finlan
13. Franny Osman
14. George Kahale
15. Greta Jochem
16. Ishmael Sharif, MassDOT
17. James Starkey
18. Jay Flynn
19. Joe Kurkland
20. Joshua Brown

21. Julia Blyth
22. Kari Nijiiri
23. Kris Gunderman
24. Kris Kretsch
25. Laura Sylvester
26. Loreen Flockerzie
27. Marie Harpin
28. Marla Allisan
29. Meghan Labbee
30. Melissa Glick
31. Michael Perreault
32. Rana Al-Jammal
33. Rauley Caine
34. Susan Bisiewicz

Northern Tier Passenger Rail Study Public Information Meeting #1
Thursday, July 14, 2022, 6:00 PM
Held Virtually Via Zoom

Meeting Notes

The Northern Tier Passenger Rail Study team held a Public Information Meeting on July 14, 2022. At this meeting, the Study team provided an overview of the updated Goals and Objectives for the Study, information from prior Studies, the current conditions of the corridor, and next steps for the Study. The meeting concluded with a discussion of issues and opportunities for consideration during the Study. Members of the public were given the opportunity to share comments and questions at the end of the meeting.

Meeting Notes

1. *Welcome, Ground Rules and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the meeting and are informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself and explains the ground rules for the meeting including how the public can participate. Makaela Niles (MassDOT) reviews the agenda for the Public Information Meeting.

2. *Study Background, Study Overview, and Study Goals and Objectives by Makaela Niles, MassDOT (Project Manager)*

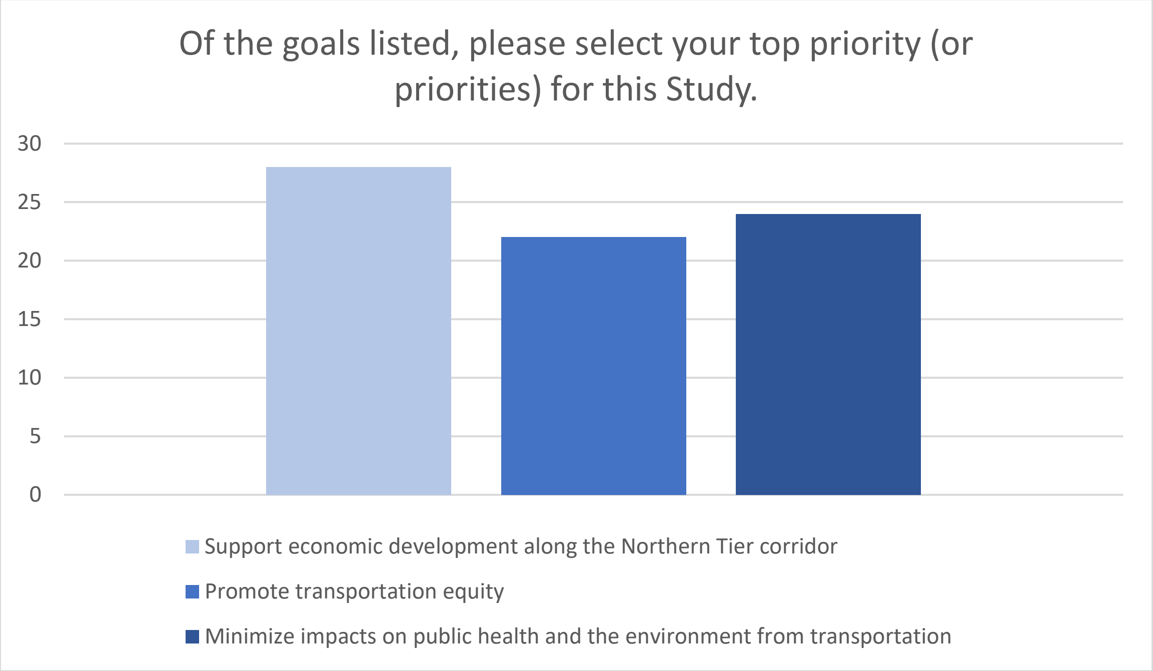
Makaela Niles (MassDOT) reviews the Study background. Through Section 84 of the 2020 state budget, the Massachusetts Legislature directed MassDOT to conduct this conceptual Study to examine the statewide and regional economic and environmental benefits as well as any associated implementation challenges. The Study will aim to identify all necessary improvements to support passenger rail service between Northwestern Massachusetts and Boston.

The Study process includes the following:
- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

Makaela Niles (MassDOT) presents the proposed set of goals and objectives for the Study and describes how the feedback from the first and second Working Group meetings was used to update and refine the goals to include the following:

- Support economic development along the Northern Tier corridor
- Promote transportation equity
- Minimize impacts on public health and the environment from transportation

A poll is launched to better understand the attendees' top priorities of the Study. Here are the results:



3. *Review of Past Efforts by Paul Nelson, HNTB*

Paul Nelson (HNTB) reviews the past efforts. The Study team has reviewed 25 past efforts including passenger rail and transportation studies, municipal transportation plans/studies, and economic development studies. The Study team has also identified information related to demographics, rail infrastructure conditions, environmental resources, travel patterns and/or trends, as well as future conditions.

The key takeaways of this include the following:

- No previous corridor-wide evaluation of travel conditions along Route 2
- Most transportation planning has been focused more on local travel
- Opportunity for passenger rail service to tie into economic development efforts throughout the Study area
- Need a better understanding of travel pattern changes due to COVID-19

4. *Current Conditions: Market Analysis by Paul Nelson, HNTB*

Paul Nelson (HNTB) reviews the corridor demographics (i.e., population, cost of living, zero car households and poverty levels, employment and economic development, tourism and major attractors, and the 2020 to 2040 socio-economic forecasts) and gives an overview of the overall travel patterns and travel by vehicle.

Paul Nelson (HNTB) notes the following from the demographic data:

- All data represents pre-COVID conditions (2019)
    - Full impact of COVID on society and travel patterns is still not fully understood
    - Study team will be monitoring trends tied to commuting patterns, other travel patterns, employment trends, etc.
- The Study team is using most current MassDOT-approved population and employment forecasts by UMass Donahue Institute
    - Updated forecasts that incorporate the 2020 Census and potential COVID impacts are in development

Paul Nelson (HNTB) reviews the Northern Tier Analysis Sections, explaining that the Study team identified the different parts of the Study corridor as the Western, Central, and Eastern segments/zones. He reviews the following information:

- Total population: 1,751,000 (high growth in East between 2010-2022 and low growth and decline in West and Central)
- Total employment by corridor segment (89% in the East, 8% in Central, and 3% in the West)
- Partial list of major attractors that need to be considered when thinking about the different trip making patterns (the Study team will identify access issues and opportunities)
- 2020 to 2040 projected population changes: growth in job opportunities fuel population growth in East segment and slower growth in West and Central segments
- 2020 to 2040 projected employment changes include a concentration of new jobs in urbanized areas and a reduction in the employment pool because of the aging population and loss of younger workers in West and Central segments by 2040

Paul Nelson (HNTB) gives an overview of the data sources which include the following:

- Location-based Services (LBS) used to understand travel patterns:
    - StreetLight Data: anonymized location records from smart phones and navigation devices
    - INRIX: location-based data and analytics such as travel time and traffic conditions
- American Community Survey (ACS) Journey to Work: developed by the United States Census Bureau based on five-year average of survey results between 2015-2019

Paul Nelson (HNTB) highlights the following travel information:

- 29% of trips in Massachusetts have an origin destination in the Northern Tier communities
- Travel declined in all three segments in 2020 due to COVID-19
- Highest mode share for daily travel in the corridor (92% in the Central segment)
- 92% of household have access to a vehicle in West and Central segments
- Congestion delay is most prevalent between Fitchburg and Boston
- Primary travel is within the Route 2 corridor

Paul Nelson (HNTB) highlights the following from the travel patterns overview:

- Motor vehicles are the predominant mode of travel, especially west of I-495
- Most travel in the corridor is local (same county or adjacent)
- Travel volumes along Route 2 have grown closer to Boston but stagnated farther west
- Travel options beyond motor vehicle are limited west of Fitchburg

Market Analysis: Findings & Conclusions

- Lack of transportation options
    - Intercity travel choices west of Fitchburg are limited outside of personal vehicle use
- No unified corridor travel behavior
    - Trips leaving each segment more likely destined to communities outside the Route 2 Corridor
- Population and employment declines expected to decrease travel demand from Worcester County westward
    - Based on current projections, underlying demographic dynamics could reduce major growth in these areas of the corridor

5. *Current Conditions: Ownership, Operations, Right-of-Way by Anna M. Barry, HNTB*

Anna M. Barry (HNTB) explains that as of June 1st, CSX has acquired Pan Am Railways (PAR). She notes that Pan Am Railways' 1,200-mile rail network through New York, Massachusetts, Connecticut, Vermont, New Hampshire, and Maine is now part of CSX's much larger 21,000-mile network, serving the eastern United States and parts of Canada. She mentions that CSX assumes PARs half ownership of the Pan Am Southern LLC (PAS) and that PAS is a separate railroad jointly owned with Norfolk Southern that operates freight service from Ayer, MA into Vermont, and New York State, however PAS owns the right-of-way between Fitchburg and North Adams. She explains that the Massachusetts Bay Transportation Authority (MBTA) operates commuter rail service out to Fitchburg with 34 daily passenger trains. Pan Am Southern/ Pan Am Railway operations on the Northern Tier consist of about 10 trains daily and dispatching responsibility does not always align with ownership. PAS performs dispatching on MBTA-owned stretch from Ayer to Fitchburg and the MBTA has the right to assume dispatching responsibilities under some circumstances.

Anna M. Barry (HNTB) references several maps that show ownership, maintenance, and dispatching along the track, as well as the class of railroad track and allowable speeds. She notes that ruling grades are uphill grades that impose limits on the weight and size of a freight train, meaning this may require operation of lighter and more frequent freight trains, while heavier trains are slower on uphill grades, and both have an impact on passenger rail service. She also notes that there are 78 total active grade crossings, explaining that active warning devices typically include flashing lights and potentially gates, whereas passive warning devices typically include railroad cross-buck signs, stop signs, and other warning devices that alert a driver or pedestrian that a grade crossing is present.

6. *Issues and Opportunities Discussion by Anna M. Barry, HNTB*

- Current conditions and issues simultaneously present potential opportunities and constraints, including the ownership of the corridors and the state of the right-of-way infrastructure

  - CSX Acquisition may shift trains to B&A and may impose drawbacks such as new shared right-of-way requirements
  - The current right-of-way could support passenger service, but it has been maintained for freight service with grades, curves, and single track that could limit the quantity or raise the cost of good passenger service
  - Existing handoff between passenger and freight dispatching on the Northern Tier has been a successful model, but new ownership may change the model
- Many passenger train station locations may be able to host new stations
- Existing governance, regulatory and funding structures could support Northern Tier passenger service, including Amtrak access rights on freight railroads
- A new state Western Massachusetts Passenger Rail Authority could promote development of new passenger services

7. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) presents the next steps for the Study goals and objectives. Up to six service alternatives will be developed and evaluated through the Winter of 2023 and the Study is expected to be completed in the Spring of 2023. A workshop will be held in the Fall of 2022 to review the initial service plan alternatives, and formal working group and formal meeting announcements will be available through a few different channels including the Study website, social media, and email. She asks if there are any questions or comments from the Working Group and the public.

8. *Public Discussion by Makaela Niles, MassDOT (Project Manager), Anna M. Barry (HNTB), and Paul Nelson (HNTB)*

Makaela Niles (MassDOT) opens the discussion up to members of the public in attendance for public comment. She reminds attendees to use the raised hand button to participate verbally and that they will receive a notification on their screen to unmute once they are recognized. She says that the question-and-answer (Q&A) box can be used to submit written comments and questions and ask the attendees participating by phone to dial star-nine (*9) to raise a virtual hand. She asks that people share only one comment or question at a time and limit comments to two minutes so the Study team can hear from as many people as possible about their thoughts on issues and opportunities that should be considered during the development of the potential service plans and alternatives. She clarifies that this is certainly not the only opportunity to comment, and that comments and questions can be shared throughout the Study process using the comment form on the Study website. She asks that any elected officials and members of their staff on the call share their questions and comments first.

Senator Joanne Comerford thanks the Study team for the presentation. She comments on the Western Massachusetts Rail Authority, saying that the Senate followed the House in authorizing language for a commission whose charge is to create a rail authority and legislation to be filed next session and that there is a bond earmark in there for regional rail for $250 million. She explains that there is a great deal of promise and work embodied in that in both House and Senate members and appreciates that Anna raised that as one of the conditions. She thinks the delegation views it as a positive condition as they see the promise of federal infrastructure dollars for rail in western Massachusetts.

Makaela Niles (MassDOT) thanks Senator Joanne Comerford for the comments.

Senator Anne Gobi thanks the Study team for the presentation and asks when the Study will be done.

Makaela Niles (MassDOT) says when the Study draft report is released for public comment, there will be a public review period and the final report will be released in the Spring of 2023. The alternatives development process will continue through the Winter, but the final report will be completed in the Spring of 2023. She thanks Senator Anne Gobi.

Senator Anne Gobi thanks Makaela for the clarification.

Representative Natalie Blais thanks the Study team for the presentation and appreciates how they have woven in the importance of the role that rail could play in western Massachusetts when it comes to economic development. She explains that they are at a crossroads when it comes to a rail network in western Massachusetts and says as we look at the knowledge corridor, the Berkshire Flyer has come into existence since the last meeting which is very exciting. She also mentions that by looking at the developments along the East West rail corridor, through Springfield, Pittsfield, Boston, this is an incredible opportunity along the Northern Tier and thanks the Study team for allowing for such a robust public participation process.

Makaela Niles (MassDOT) thanks Representative Natalie Blais for the comments and for joining the meeting.

Carl McKinney thanks the Study team for their hard work and diligence. He asks if there has been any consideration not to dead end in North Adams but to go all the way to Albany, New York and possibly tie in Bennington, Vermont. He explains the reason for that is rail commuting because the greater Albany area is a standard metropolitan statistical area of 1 million people, and it is also the home of the Silicon Valley of the Eastern seaboard with good, high paying jobs and the prices in the Northern Tier area of real estate is significantly less than in metropolitan areas. He says if there is a way to move people efficiently with very few carbon emissions, then there would be additional rail traffic and it would also tie in with the North-South line going from the capital of New York down to New York City. He explains that when these lines were put in, the connection was between Boston and Buffalo, New York and stopping in Albany, so that connection has always been there and if this system can be rehabilitated and make it an efficient people-mover, it will be much more positive. He knows the Study must be done based on the data available to the Study team, but he thinks there is an opportunity to make this even better. He thanks the Study team and says he supports the Study.

Makaela Niles (MassDOT) asks Anna if she could expand upon the legislation and the potential stopping patterns that might be considered as the next part of the process is discussed.

Anna M. Barry (HNTB) says the legislation mandates that passenger rail service from Boston to Greenfield and North Adams is analyzed and studied, however the scope gives the Study team the ability to expand that into New York. She explains that the line does go through Vermont, but the Study team is able to take feedback into account as the alternatives are determined and examined as the Study progresses. She notes that the Study team has a major focus on those two termini, but even with other towns on the corridor such as Athol and Orange, the Study team is open to what those alternatives should be.

Makaela Niles (MassDOT) says she appreciates the comments and responses from Carl and Anna.

Robert J. La Trémouille says he is pleased to see this initiative. He thinks it is a reasonable follow up to the South Coast initiative and would strongly suggest connecting Fall River and New Bedford as a future goal since there is an obvious community which extends over state lines.

Makaela Niles (MassDOT) thanks Robert for the comment and says the South Coast Rail effort is currently ongoing in phase one and she shares a link in the chat for anyone wants to learn more about that project.

Joe Kurland asks if the complete StoryMap that was presented at the second Working Group meeting would be made available to the public.

Makaela Niles (MassDOT) thanks Joe for the question and explains that the StoryMap from the second Working Group meeting is available on the Study website along with other meeting materials from previous meetings, including recordings of previous meetings.

Stephen Malagodi says he wants to second the remarks from the previous commentator about extending to Albany and thinks this is vital. He comments on the mode of transportation and remarks that no one mentioned if this would be an electrified service or old diesel and given that the second highest priority on the initial priority poll was for health and environment, he asks why there has not been any mention of this being an electric service rather than diesel.

Anna M. Barry (HNTB) says that up to now, the Study team has been examining existing conditions on the railroad and have yet to address that issue. As the six alternatives are developed, there will four different service plans, types of equipment, and infrastructure to consider other than diesel and what there is now. She explains the alternative to provide double tracking, straighten out curves, add electrification, and to include various types of rolling stock can also be considered among the alternatives that the Study team explores.

Makaela Niles (MassDOT) thanks Stephen and Anna for the question and response.

Representative John Barrett says he is hopeful that he will get $5 million in the bond bill to move forward with any work that needs to be done, especially in the Hoosac Tunnel to make the repairs that have been discussed so far. He does not know how far the $5 million will go, but he thinks it will ensure the integrity of some of the track in the area going through the Hoosac Tunnel. He also mentions the importance of something Paul referred to earlier in the presentation which is that along the line in western Massachusetts is the University of Massachusetts (UMass), Williams College, and MCLA in North Adams and Williamstown. He thinks it would be vital to have it in any report as far as transportation goes. He explains people have been using buses for years so by including this it could possibly change come of the data the Study team reviews considering there are approximately 3,000 students in the northern Berkshire area and 40,000 students at UMass, which is a university that also has yearlong sport events. He says he is very pleased with the timeline and progression of the Study. He thinks this rail will be an important part of the economy and future growth along the Northern Tier from Fitchburg west.

Makaela Niles (MassDOT) thanks Representative Barrett for the comment.

Carl McKinney asks who owns the Hoosac Tunnel.

Anna M. Barry (HNTB) says it is owned by the Pan Am Southern Railroad which is owned by CSX and Norfolk Southern.

Makaela Niles (MassDOT) thanks Carl and Anna for the question and response.

Hendrix Berry asks what can voters do to help make the passenger extension from Boston to western Massachusetts happen.

Makaela Niles (MassDOT) explains that participating in public information meetings is a good start. She suggests reaching out to community leaders and elected officials to share the projects that interest them. She thanks Hendrix for the question.

Andy Hodgeland says he appreciates all the work has gone into this and shares a favorable impression of the Study so far. He expresses interest in having the Study area extend beyond North Adams into southern Vermont and into Albany. He thinks this has been a consistent theme and wants to make sure that data from southern Vermont is also used as the Study team reviews the West, Central, and East segments. He says there are a lot of potential riders in Bennington, across southern Vermont, and over to Brattleboro and he was not sure If this was included in the presentations. He encourages the Study team to expand the database north. He also says there is an opportunity for seasonal attractors, and he thinks this should be considered in the attractors analysis. There is a foliage season, Williamstown theater festival, Zoar rafting, and Berkshire East. He does not think these events could sustain a train, but they may sustain extra train service though the weekends. He says these seasonal events and special occasions are in the queue for the models.

Makaela Niles (MassDOT) thanks Andy for the question and says the Study team will make sure to capture this in the analysis.

Mariah Kurtz thanks the Study team for being so thorough and for truly addressing conditions that affect Western Massachusetts and considering the caveats such as increased rail access changing residential and traveling patterns. She says this work is very important to the economic development and transportation equity of this area.

Makaela Niles (MassDOT) thanks Mariah for the comment and says that these are certainly the goals of the Study. They Study team is looking to promote transportation equity, access, and mobility through this process.

Mark Shapp says he thanks MassDOT for this Study. He thinks the Northern Tier deserves the same level of attention as the implementation of a passenger rail service between Pittsfield, Springfield, and Boston. He comments on the fact that people can no longer get to Albany. He explains that the old Boston and Maine Railroad had a line that ran to Troy, and from there one could get to Rensselaer and says out that Amtrack's Albany station is across the river in Rensselaer. He also says there is a short industrial remnant of the old branch in Troy that is still in service with some freight customers, but the Boston and Maine line that went to Troy is gone, so he does not see how that could happen. He says that while he does not know the lay of the track in Greenfield, it seems to be a place where it could be a transfer to a Valley Flyer type of service that goes down from Greenfield to Springfield and from Hartford to New Haven and there may be people that need to go in that direction. He does not know whether the rail infrastructure in Greenfield lends itself to having across the platform connections between the two services. He also comments on how the old station in Williamston is a private property and is three miles outside of the downtown area and three miles from Williams College. He says there should be a bus connection that could meet the trains.

Makaela Niles (MassDOT) says the Study team will take this comment into consideration in the development of potential service alternatives.

Andrew Randazzo says historically, passenger rail in the United States has been significantly impacted by the prioritization of freight trains. He asks if there has been any consideration of installing an additional line dedicated to passenger service, and if not, why has it not been considered and what will be the strategy to reduce those barriers.

Anna M. Barry (HNTB) agrees with Andrew, saying most of the passenger rail rights-of-way in the United States are owned by freight lines and it is something one must contend with when trying to create a passenger service. She explains the addition of second and third tracks and enhancing signal systems creates opportunities and there are ways to allow both to coexist and operate more effectively than just running them on the same track. One of the Study team's mandates is to make sure there is not unduly interference with freight service and the Study team will look at ways that allow freight to operate as they must on what they own and to find ways for a quality type of passenger service. She says it is possible to go so far as to create a new right-of-way, but as the alternatives are developed, the Study team will have to determine the practicality of it all and the costs in terms of modifying system right-of-way or creating new ones.

Makaela Niles (MassDOT) thanks Andrew and Anna for the question and response. She says that John Orrison, a member of the Study team, could provide more insight to one of the previous questions from Mark.

John Orrison (HNTB) says Mark's statement about the Boston and Maine route no linger existing to Albany direct is correct. He says that there used to be a line that went straight into Albany once getting into the New York State area, but now there is a positive connection that is in place, which is moving westward on the Pan Am property or the Pan Am Southern. He explains there are connections to the Canadian Pacific Railway, and then there are connections to that are also in place to move downward and connect to the Amtrack ownership that goes into Albany. The route is a bit longer than the historical route, but there is a route the Study team could look to possible analyze train operations to and from Albany.

Makaela Niles (MassDOT) thanks John for the response.

Carl McKinney says in connecting with Albany going through Greenfield and down to New Haven and then back up would not make sense for the Northern Berkshires. He does not think this option should be thrown out since a goal is to get people to where there are employment opportunities. He also says if three states are cooperating on this, there is a greater chance of getting stuff through Washington and getting more federal funding for this. Carl says his understanding is that the president is a big fan of passenger rail, but he thinks the goal is to consider both tourism and employment opportunities when discussing the use of the proposed passenger rail system.

Makaela Niles (MassDOT) thanks Carl for the comments.

Daniel Cantwell says he supports trains to and from New York City, pointing out the Massachusetts Museum of Contemporary Art (MASS MoCA) as an attractor.

Makaela Niles (MassDOT) thanks Daniel for the comment.

Brittany Polito asks if there is an estimated projected cost for the Northern Tier Passenger Rail and how will it be funded.

Anna M. Barry (HNTB) says the Study team is currently developing service plans and alternatives. This includes what those services look like, how many trains, where will they go, where will they stop, what types of equipment do they use, and their speeds. Once the alternatives are established, there will be a workshop on a few of them in September. She explains that during this time, the alternatives will be evaluated, and the cost estimates will be developed in addition to other aspects that will be used to analyze the impacts the service plans would have. This includes the number of riders, how much economic development they generate, and this will be compared with costs for the various types of infrastructure, rolling stock, and other improvements needed to achieve any service plans.

Makaela Niles (MassDOT) thanks Brittany and Anna for the question and response. She says a question submitted in the Q&A box starts with seconding the idea to continue into to continue to Bennington and Albany, but also asks about the timetables. She asks if Anna if she could speak about the development with that and the considerations of connecting to other services in the area.

Anna M. Barry (HNTB) explains the Study team is looking at up to six alternatives and those alternatives will include where they begin, where they end, what the various stops are in between, the types of equipment that will operate, and what kind of connections. She says some things that must be taken into consideration is why people want to use the trains and the types of connections people have mentioned. These include connections at Greenfield, with the possibility of local bus connections along the way, Fitchburg, and Springfield between the Amtrak service that currently operate through Massachusetts on the CSX line. She explains all these factors will be considered as part of the service plans that are put together, and the best of each will be used to show the different types of services that could be used to develop those alternatives.

John Orrison (HNTB) says the Study team is currently analyzing the connection opportunities in Greenfield for the North South. For the Vermonter there are two, on train each way a day and the Amtrak plan is to increase that frequency to two each way. The Study team is also looking at the connections for the Valley Flyer train. He says once you get into Boston, in terms of being able to make a connection to the Downeaster, they currently have five trips each way a day. The Study team is aiming to make it as well knit into the transportation modes, so comments and questions from the public are welcomed and will be considered in this process.

Makaela Niles (MassDOT) thanks them for their responses.

Ben Westbrook says he lives in North Adams and would certainly ride the train to Greenfield a couple times a month and might bring his bike to ride to Northampton. He says that is not a trip he makes currently, and so not algorithmically trackable, but he bets plenty of other people living in North Adams would take advantage of it.

Makaela Niles (MassDOT) thanks Ben for the comment.

Marcel LaFlamme says he currently lives in Worcester and grew up in rural western Massachusetts. Marcel has returned to the state last summer after ten years in other parts of the country because of rail. He says it is the furthest point west that enables them to live and have a reliable rail connection to Boston for work and travel. He would like to buy a home in Franklin County and says Northern Tier rail service would be the game-changer that would make this possible. Marcel hopes the Study team will take situations like this into account when forecasting traffic.

Makaela Niles (MassDOT) thanks Marcel for the comment.

Clare Deucher asks if there will be an opportunity to institute any kind of public transportation from Fitchburg south into Worcester or from Fitchburg south to Amtrak service in New York City.

Anna M. Barry (HNTB) says Amtrak currently operates service from Greenfield to Springfield and then down to New Haven, as well as the Connecticut service that runs from Springfield to New Haven with a high-speed rail connection there in New Haven for New York City. The other services between Fitchburg and Worcester or other locations are not necessarily the focus of the Study, but it is possible that the service plans and service alternatives that are developed might inspire other studies or initiatives to create the connection that could compliment a service that is being reviewed in this Study.

Makaela Niles (MassDOT) thanks Clare for the comment.

Ben Westbrook says the trains would be packed for bigger concert events at MASS MoCA.

Makaela Niles (MassDOT) thanks Ben for the comment and says the Study team will be looking at big attractors across the Study corridor.

Carl McKinney asks if there is any way to help the Study team and suggests hosting community information sessions in the towns along the Northern Tier.

Makaela Niles (MassDOT) says one way to help would be through letting people know about this process. The Study team would like to reach out to as many people as possible and to receive input from the public. She says there will be a workshop later this year to further discuss the development of service alternatives and it would be helpful if this information was shared by people who are familiar with the Study.

J M says going to Boston late in the day sometimes eliminates getting the commuter rail to the South Shore and would like to get there early in the day to make tourism and visiting family easier.

Makaela Niles (MassDOT) says this comment speaks to Paul’s portion of the presentation regarding trip making and is a big consideration of this process.

Anna M. Barry (HNTB) says these are the considerations that the Study team is looking at as the alternative service plans are put together. She says this includes the types of trips people want to make and what time of day is most suitable for making them the Study team is trying to put together schedules that accommodate a variety of needs including making connections to other locations whether it is in Maine or in the south shore of Massachusetts.

John Orrison (HNTB) says as the Study team develops intercity and passenger train schedules, and they will look at arrival times at North Station and then commutes between North and South Station to be able to make some positive connections for travelling southward or vice versa. He says this comment will be considered as the schedules are developed.

Joe Kurland asks what can be done to create a cross platform connection at greenfield given that the current station platform is not between the tracks as the old station was.

Anna M. Barry (HNTB) says the Study team is not quite there at this phase of Study but will look at the service alternatives which will include those connections. She explains that as the Study team goes into the next phase after that, they will look at what is required by way of infrastructure improvements to make those changes. She says that is a challenging location but as the Study team looks at how it could be made, the Study team has expert track station staff who can support.

Richard Duncan asks how many trips per day and per week are being considered.

Anna M. Barry (HNTB) says the Study team is in the process of determining this now and no conclusions have been drawn at this point, however there will be up to six alternatives that will likely include a variety of numbers per day and days per week so that will be something that to discuss further in the fall when the alternatives are announced the workshop is held.

Mary-Ann Palmieri says she hopes cost will be considered since working people and the elderly will be using this corrido.

Makaela Niles (MassDOT) says that will be included in this process.

Mark Shapp asks if the trains are going to terminate and originate in North Adams, has any thought been given regarding a layover facility there so trains can overnight and be serviced to kick off the next morning's service to get to Boston at a reasonable hour. Additionally, he asks if the Study team has considered how the cars will be cleaned and about having to overnight trains in North Adams and talked to anyone from there about where a layover facility could be built. He points out that the Berkshire Flyer was conceived by people who did not seem to mind that Berkshire residents could not use the service. This service is only configured for people in the New York metropolitan region to go up to Pittsburgh and the Berkshires and come back on Sunday afternoon. He says as a practical matter, the people who live in Berkshire have been excluded and sees things in the way of getting that service expanded so it can a "two-way street".

Anna M. Barry (HNTB) says this is an excellent point and everyone on the Study team go back many years in the railroad business and this is exactly what we will be considering as the services are put together. She explains there are many ways to do services of these types and the most efficient way would be to have a layover at the end of the line and depending on availability, there must be a place to park the trains and they would need to be serviced overnight with fuel and sand in the locomotives. She also says the trains would need to be cleaned, including the toilets, with portable trucks, food would need to be supplied if they have a food service onboard. These are all questions that will be considered as the Study team evaluates the alternatives. She also says the Study team will think of the most cost-effective way to supply all the needs that the trains and customers will have for the kind of alternatives that are being put together.

Makaela Niles (MassDOT) thanks Mark and Anna for the questions and responses.

Jerry Lund asks if the Study team could send out more notices with links to the upcoming meetings and evolving.

Makaela Niles (MassDOT) says she is excited to let everyone that a monthly Study update e-newsletters are being sent out and encourages everyone to visit the Study website and to sign up for Study updates to receive information on the Study or to receive those e-newsletters and meeting information. This is also posted on the Study website, social media, and via email whenever there are formal meetings and workshops. She thanks Jerry for this question.

Ben Heckscher says that in the 1950s, the Boston & Maine Railroad provided passenger service between Boston North Station and Greenfield that took two hours and fifteen minutes. He asks if it is reasonable to expect that the service offering proposed in the Study will at least be able to meet this schedule.

Anna M. Barry (HNTB) says the Study team has been looking at the historical timetables as they have been developed. She says that while she is not familiar with that trip time, the Study team will be looking at the historic speeds and train services and what kind of trip times they had as the trip times for this Study get developed for some of the early alternatives. One of the Study team's goals is to make them competitive with the historic record to whatever degree is reasonable now.

John Orrison (HNTB) thinks this was a great question about the transit time between points, especially in Greenfield and in North Station. The Study team has been looking though the whole series of schedules including 1946 and 1950's schedules. He says by getting that data, the Study team would like to compare it with what could be created with this train service in the future. John says that the good news is the MBTA has spent a lot of money on upgrading the Fitchburg lines back around 2008 through 2012 and that was double tracking and increasing speeds from 60 miles an hour to 79 miles an hour. He explains they have actually reduced the transit times between North Station and Fitchburg than what you could achieve back in the 1950's. The second part of this is that in 2022 passenger equipment is much more advanced than what was available in the 1950's. He says the 1950's equipment is called heritage equipment and it could only go so much faster, a little bit faster than freight trains around curves but today's MBTA and Amtrak equipment can actually achieve higher speeds around the existing curves that are there. John says he is not ready to give a report on it, but the Study team is taking those facts into consideration in terms of what was historical transit times and what are achievable for today.

Makaela Niles (MassDOT) thanks everyone for the questions and responses.

Constance DiMarino thanks everyone who has supported and promoted expanding rail in Western, MA. She says she lives in Greenfield and experiences the benefits of the local train.

Makaela Niles (MassDOT) thanks Constance for the comment.

9. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) thanks members of the public for attending and sharing their comments and questions. She encourages attendees to visit the Study website to submit additional comments or questions or sign up for Study updates and monthly e-newsletter. The materials from this meeting, including the StoryMap presentation, video recording, and meeting summary, will be made available on the Study website.

Northern Tier Passenger Rail Study Public Information Meeting

MassDOT/Study Team:

- Makaela Niles – MassDOT
- Anna M. Barry – HNTB
- Paul Nelson – HNTB
- John Orrison – HNTB
- Lauren Dvonch – HNTB
- Sara Stoja - HNTB
- Andreas Aeppli – Cambridge Systematics

Working Group Members & Alternates:

1. Jo Comerford – State Senator
2. John Barrett – State Representative
3. Linda Dunlavy – Franklin Regional Council of Governments
4. Natalie Blais – State Representative
5. Peter Lowitt – Devens Enterprise Commission

Public Attendees:

1. Alan Butler
2. Alec Wade
3. Andrew Randazzo
4. Andrew Smith
5. Andy Hodgeland
6. Anne Gobi, State Senator
7. Bekkazoe Eowind
8. Ben Heckscher
9. Ben Westbrook
10. Brad Harris
11. Brittany Polito
12. Bryan Smith
13. Carl McKinney
14. Charlotte Minsky
15. Christine Sullivan
16. Clare Deucher
17. Clete Kus
18. Constance DiMarino
19. Dale LaBonte
20. Dana Roscoe
21. Daniel Cantwell
22. David Knavel
23. Deborah Benoit
24. Douglas Stotz
25. Eric Smith
26. Gabrielle Taylor
27. George Snow
28. Greg Vine
29. Hendrix Berry
30. Holly Rueger
31. Huff Templeton
32. J M
33. Jeffrey Lin
34. Jerry Lund
35. Joe Kurland
36. Johan Sednek
37. John Kapitzky
38. Kara Walsh
39. Karen Benko
40. Katie Stetner
41. Keith McGuirk
42. Kelan O’Brien
43. Kurt Schellenberg
44. Laura Hanson
45. Lora Wade
46. Marcel LaFlamme
47. Marcia Berkall
48. Margaret Scarsdale
49. Mariah Kurtz
50. Mark Shapp
51. Mary Byrne
52. Mary-Ann Palmieri

53. Max Pavlov
54. Michele Spring-More
55. Patricia Duffy
56. Paula O'Halloran
57. Peter Gagliardi
58. Richard Duncan
59. Robert J. La Trémouille
60. Roy Kimmel
61. Sarah Markham
62. Sharon Moulton
63. Shaw Izikson
64. Stephen Malagodi
65. Tom Hankinson
66. Travis Condon
67. Walker Powell
68. Werner Gertje

Northern Tier Passenger Rail Study Public Workshop
Wednesday, January 11, 2023, 6:00 PM
Held Virtually Via Zoom

Meeting Summary

The Northern Tier Passenger Rail Study team held a public workshop on January 11, 2023. At this workshop, the Study team presented the two initial service plan alternatives. The information was presented in three modules, and each module concluded with a discussion. The feedback from this meeting will be used to inform the development of four additional service plan alternatives.

Meeting Notes

1. *Welcome, Ground Rules and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the meeting and are informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself and explains the ground rules for the meeting including how the public can participate. Makaela Niles (MassDOT) reviews the agenda for the public workshop, which includes an overview of the Study process and a presentation on three modules, each one followed by a discussion.

2. *Study Process by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) reviews the Study process.

The Study process includes the following:
- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

Makaela Niles (MassDOT) explains that Task 5 (potential service plans and alternatives) and Task 6 (alternatives evaluation and cost estimate) will be discussed at this workshop. Based on the feedback received, the Study team will refine the two initial alternatives and four additional alternatives will be developed and evaluated. Recommendations will also be developed, and all this information will be documented in a draft report which will be released for public comment, then finalized in a final report. Makaela Niles (MassDOT) asks elected officials to share any remarks.

Senator Joanne Comerford thanks the Study team for the presentation, the regional planning agencies who have offered counsel and informed the delegation, and all colleagues in attendance.

Senator John Cronin thanks the Study team for the presentation. He also thanks Senator Comerford for her leadership.

Representative Natalie Blais thanks the Study team for the presentation and thanks all colleagues and Massachusetts residents in attendance for such an important rail project in Massachusetts. She says there is so much potential for rail in Western Massachusetts and values all the opportunities for public participation.

Representative Mindy Domb thanks the Study team for the presentation and all opportunities for public comment. She thanks Senator Comerford and Representative Blais for their leadership, as well as the members of the public in attendance as this Study advances.

3. *Module 1: Alternatives Development Approach and Methods by Anna Barry, HNTB*

Anna Barry (HNTB) reviews the alternatives development approach and methods as part of module 1. The Study team will evaluate alternatives in two phases. Phase 1 includes a lower investment option and a higher investment option. Phase 2 will include four additional alternatives, and the alternatives inform the Study's overall recommendations and implementation plan. This process relies on technical work tied to rail simulation, ridership estimation, and construction cost estimation. The similarities and differences between the two alternatives are reviewed.

Anna Barry (HNTB) reviews the following:

- Rail Simulations 101:
  - Rail Traffic Controller (RTC) is the industry standard for simulating rail service to estimate train performance and trip times for each train and involves the following steps:
    - Step One: The simulation model is coded using detailed inputs about track designs, train configurations, and their proposed schedules.
    - Step Two: The RTC software "dispatches" the trains through the network. RTC will attempt to resolve any conflicts by delaying or rerouting a train.
    - Step Three: The RTC software resolves all conflicts and produces detailed outputs on the systems performance.
  - These outputs will be compared between alternatives to evaluate the benefit of the proposed infrastructure or operational change and the potential service alternatives between North Adams and Boston.

- Rail Simulation Inputs:
  - Track condition (e.g., FRA track class speed and timetable speed restrictions)
  - Track geometry (e.g., grade and curves)
  - Track configuration (e.g., single track mainline, single track with passing sliding, and double trach mainline)
  - Train Schedules (e.g., freight trains and proposed passenger trains)

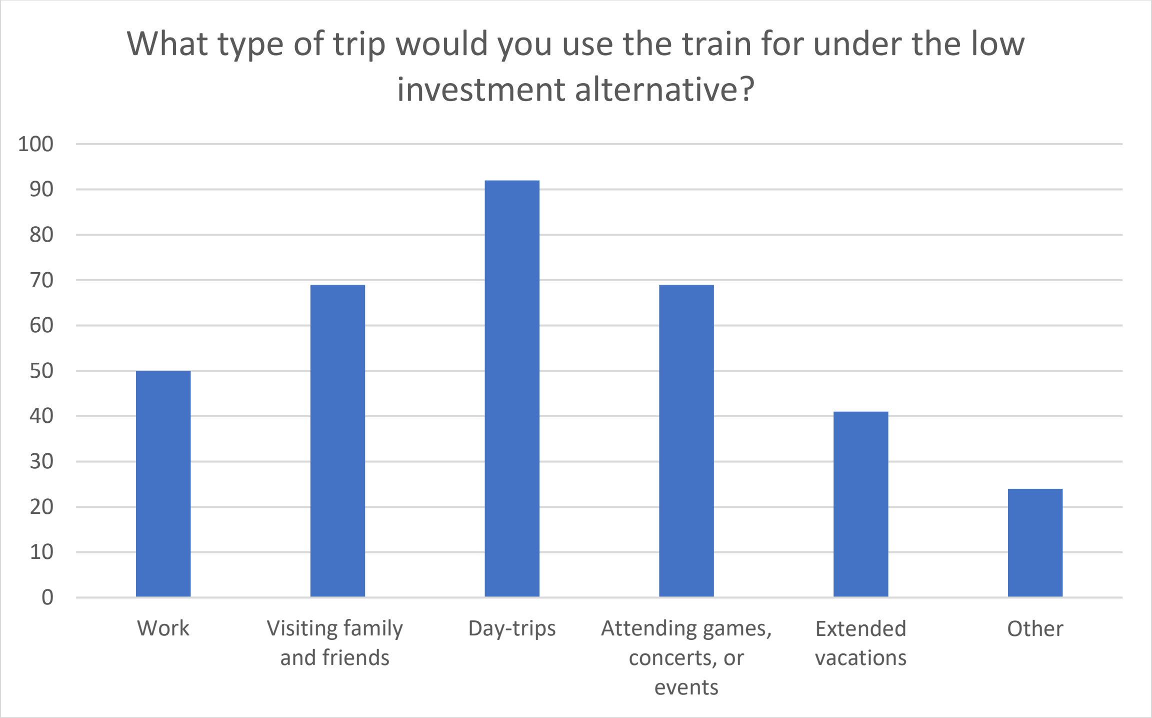
  - Signal Control System (e.g., automatic blocks, centralized traffic control, positive train control (PTC))
  - Grade Crossings (e.g., average daily vehicle traffic, type of crossing protection)

- Rail Simulation Outputs:
  - Animation of train movements
  - Time-distance diagrams (stringlines)
  - Train performance calculator
  - Track occupancy chart
  - Detailed train status
  - Timetables
  - Operating statistics

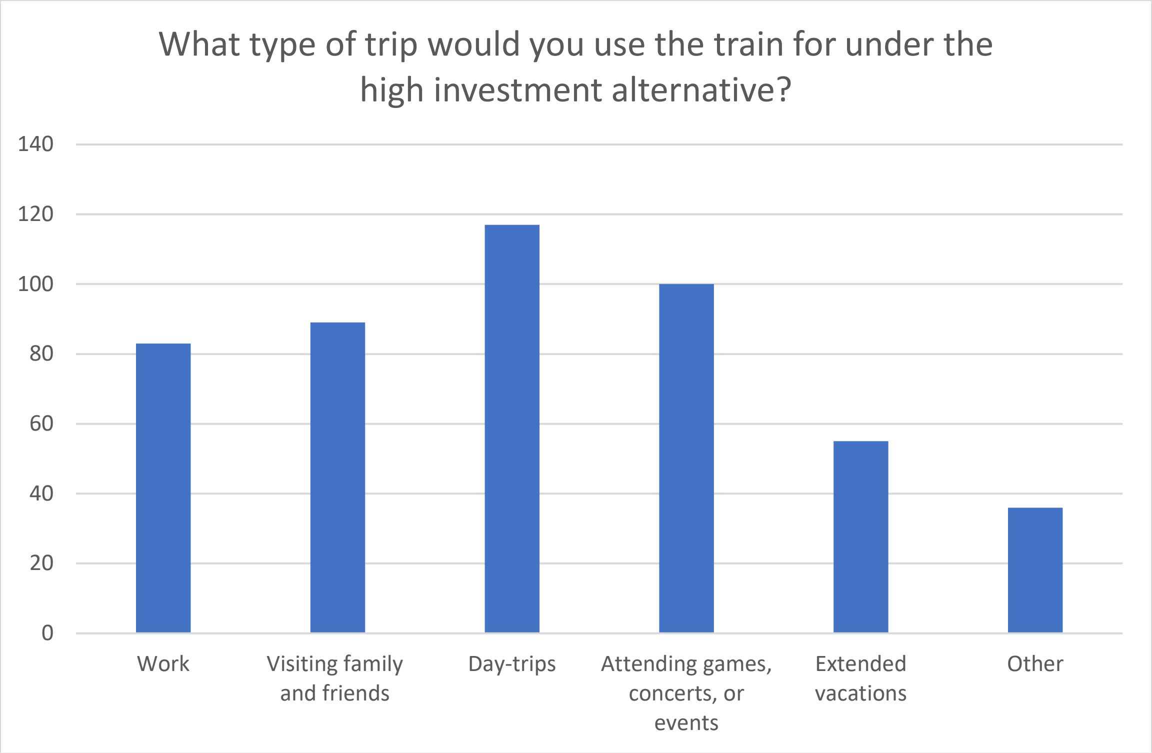
- Lower Investment Alternative Times:
  - Eastbound run times:
    - North Adams 0, Greenfield 1 hour 19 minutes, Fitchburg 2 hours 53 minutes, Boston North Station 3 hours 55 minutes
  - Westbound run times:
    - Boston North Station 0, Fitchburg 1 hour, Greenfield 2 hour 35 minutes, North Adams 3 hours 59 minutes

- Higher Investment Alternative Times:
  - Eastbound run times:
    - North Adams 0, Greenfield 47 minutes, Fitchburg 1 hour 50 minutes, Boston North Station 2 hours 48 minutes
  - Westbound run times:
    - Boston North Station 0, Fitchburg 59 hour, Greenfield 2 hours, North Adams 2 hours 58 minutes

A poll is launched to better understand the types of trips attendees would use the train for under the lower investment alternative:



A poll is launched to better understand the types of trips attendees would use the train for under the higher alternative investment:



- Ridership Estimation 101:
    - Understanding potential ridership helps weigh the benefits and costs of a new passenger rail service.
    - These estimations require data and the use of analytic tools to inform the Study team about travel markets.
    - Pairing demographic information with ridership projections enables equity analysis of the impact of the rail project.

- Defining the Overall Travel Market:
    - Travel market analysis for study based on existing travel flows – this can be changed by service and policies.
    - A study analysis is a good approach for feasibility testing, with more detailed approach available as needed.
    - This workshop focuses on a range of estimates because of less available details about impact of change at this early stage.

- Overview of Data Sources:
    - Streetlight Data Location-based Services (LBS) – anonymized location records from smart phones and navigation devices.
        - Streetlight data has one to thirty-five percent sample rate of the total travel market.
    - American Community Survey (ACS) Journey to Work – Census collected information on locations of households and workplaces.
        - Based on five-year average of survey results between 2015-2019.

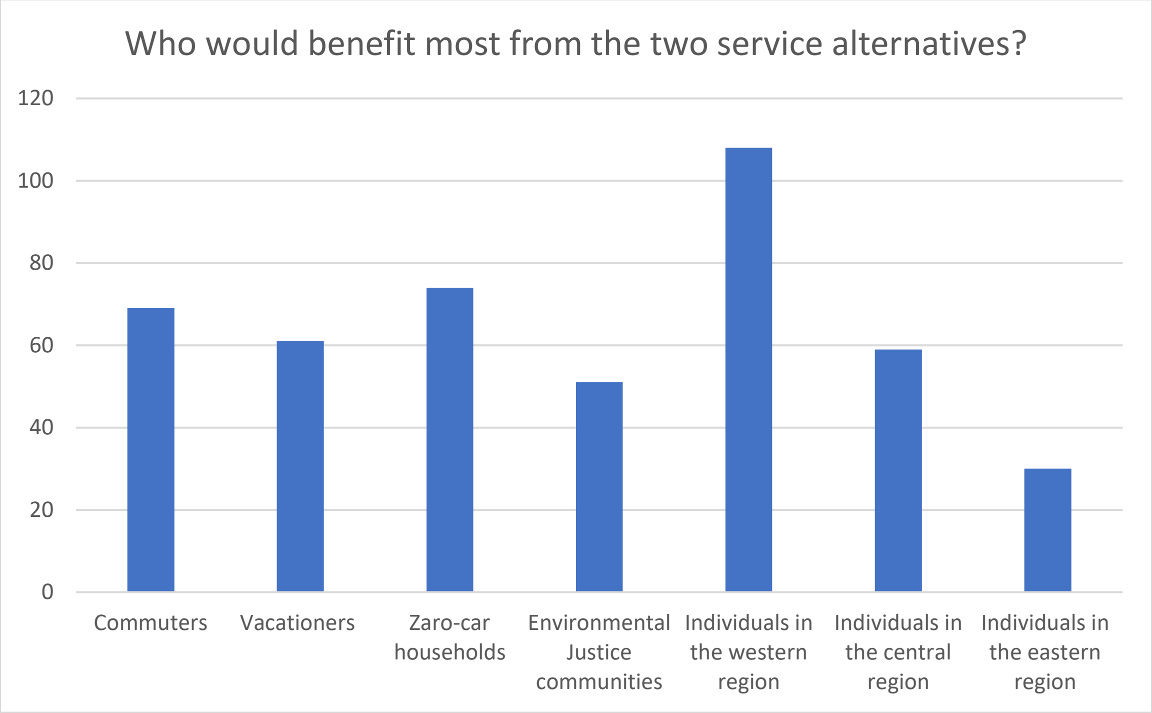
Anna Barry (HNTB) gives an overview of travel in the Northern Tier corridor. The total daily trip origins by corridor segment are as follows: five percent originate in the western segment, twelve percent originate in the central segment, and eighty-three percent originate in the eastern segment. This data is used to estimate the ridership and develop a model. This process includes the following steps:

- Ridership Estimation Process
    - Step One: Develop model to predict ridership based on observed MBTA and Streetlight data.
    - Step Two: Estimate Downeaster travel time elasticities (i.e., each additional minute of travel time reduces boardings by X%).
    - Step Three: Apply MBTA boarding model to estimate corridor boardings by market and number of trains and apply Downeaster travel time elasticities to adjust boardings for longer travel times.

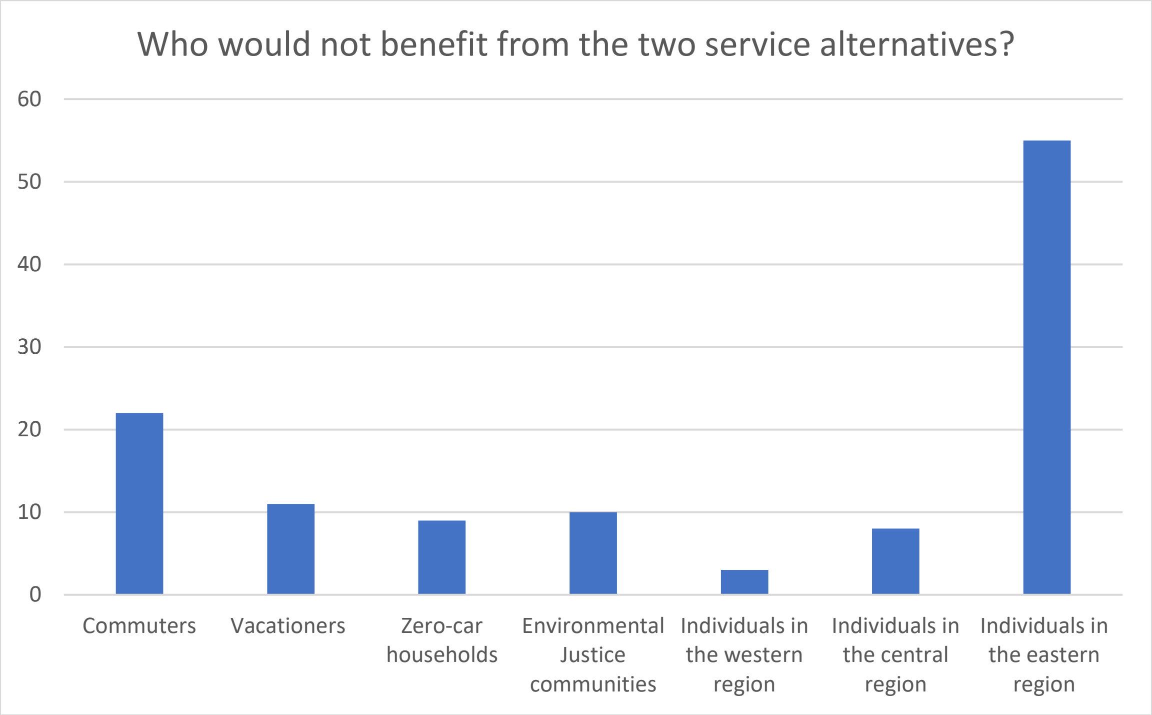
Anna Barry (HNTB) reviews the initial ridership estimation for the lower and higher investment scenario estimates. The main takeaways include the following:

- Baseline travel market decreases with distance along the corridor.
- There may be some increase for TD Garden, Red Sox, and other special events, but increase not as significant as other corridors with shorter trip times and established travel patterns.
- Trip times has a large impact on ridership.
- Changes in population and employment could impact these estimates.

A poll is launched to better understand who the attendees think would benefit the most from the two service alternatives:



A poll is launched to better understand who the attendees think would not benefit from the two service alternatives:

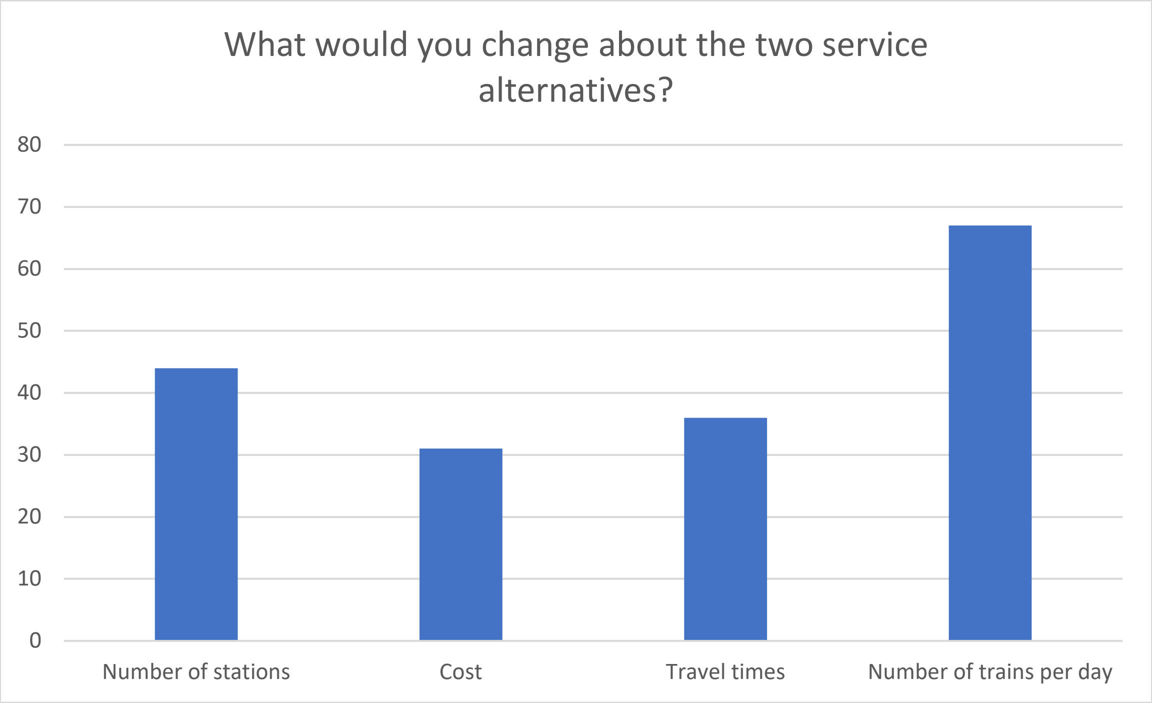


Anna Barry (HNTB) reviews the cost estimation process. Factors such as materials, location, equipment, and labor are considered and depend upon the level of design. The Northern Tier Study is at a pre-design stage. Contingency costs account for unknown but expected elements of the project. The cost estimates are based on material, equipment, and labor costs from recent railroad construction projects in Massachusetts and surrounding states.

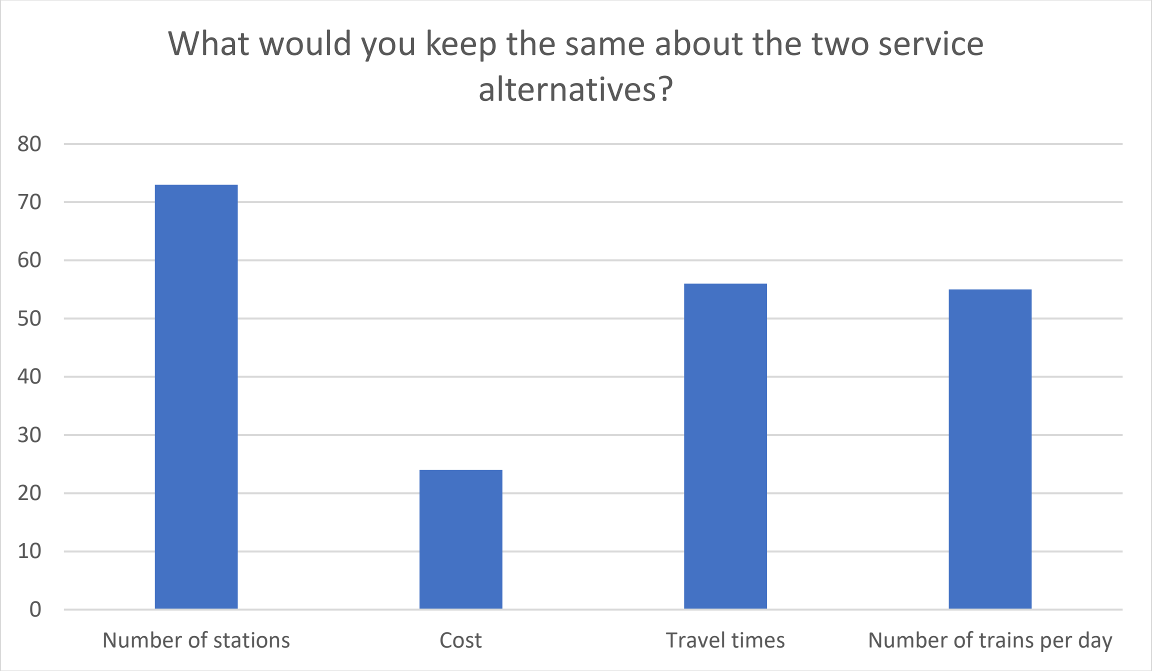
Anna Barry (HNTB) compares the initial cost estimates of the initial lower investment alternative, which is approximately $1,044,850,000 (total project cost per mile is $7,358,100), and the initial higher investment alternative, which is approximately $2,187,350,000 (total project cost per mile is $15,403,875). The main takeaways include the following:

- Passenger rail needs are different from freight rail needs.
- The introduction of passenger rail service requires significant investment, even for moderate improvements in speeds.
- The extent of rail upgrades is a major differentiator.
- The costs include contingencies at Pre-Feasibility stage.

A poll is launched to better understand what the attendees what change about the two service alternatives:



A poll is launched to better understand what the attendees would keep the same about the two service alternatives:



4. *Public Discussion by Makaela Niles, MassDOT and Anna Barry, HNTB*

Greg Vine asks about the meeting materials being made available for review.

Makaela Niles (MassDOT) says the meeting information will be made available on the Study website.

Brendan asks will the evaluations look at that new generation of equipment since Amtrak is buying the Airo trainsets that will supplant Amfleet.

Anna Barry (HNTB) says the Study team can investigate this. The current estimates are based on equipment with characteristics the Study team is familiar with, but this could be considered and evaluated in other alternatives.

John Garrett says he is thrilled to see these options are feasible. He says he used to live in Chicopee, MA and has gone to several meetings in 2014 for studies between Boston and Springfield which did not advance. He also says it is unfortunate since the Commonwealth is seeking these services and these two alternatives have the potential to transform areas like Greenfield into places that can connect with the rest of the Commonwealth. He says he is thrilled to see this Study team working on this with a mandate to make this happen and that Franklin County is one of a few counties that has declined in population, so this could make a difference.

Faith Williams asks why medical appointments were not included as a reason to use the train and says many people in the west travel to Boston for specialist healthcare.

Makaela Niles (MassDOT) thanks Faith for the question and says the Study team has been garnering input on the reasons people would use this rail service.

Carl McKinney thanks the Study team for their work and asks if reductions in travel times for freight trains have been thought of considering the shortages and supply chain issues and transportations issues seen in the last few years. He also asks if the Study team has evaluated the potential to reduce population declines.

Anna Barry (HNTB) says the Study team used information on train traffic anticipated by the CSX acquisition for the initial projections, which can change but the Study team is currently using this information. She also says the initial projections are based on ridership travel modeling are based on existing population and projections that developed over several years so other alternatives can be considered based on the trends.

Garrison Taylor asks if the ridership calculations considered the large student population in the western region that might not currently travel at all.

Anna Barry (HNTB) says the Study team used existing population data and existing projections of current travel patterns to develop the initial projections, and as more details on these groups and travel plans and changes emerge, this information will be included in other alternatives.

Tom Bernard says he echoes the comment from John Garrett regarding connectivity in Greenfield and thinks that this should be extended to the Berkshires. He says that while he appreciates the science to the projections and the modeling, there is no model for places west of Fitchburg. He says that the demand is likely substantially higher than projected and notes that it will never be less expensive to complete this project than it is now.

Representative John Barrett says Berkshire and Franklin are the two counties in Massachusetts that have experienced a decline in population. He says the $2.1 billion costs of this project compared to what has been put into roads and bridges for improving access to Boston from the western part of the state is a small price. The Berkshires could see a migration from the eastern part of the state and southern Vermont could impact the ridership of this service. He says that as far as the Hoosac Tunnel goes, there will be several millions of dollars needed to fix the existing conditions and it might be good to have fewer freight trains going through there. He believes that broadband service and this train service will build the economy over the next 15-20 years in Berkshire County and the higher investment alternative would be the best option.

Christopher Silvia asks if the project plan, travel demand, and schedule account for transfers with Amtrak trains in Greenfield.

Anna Barry (HNTB) says the Study team tried their best to select stopping times at Greenfield to match up with some of the station times of the Valley Flyer and Amtrak. In other alternatives, these connections could be further improved.

Greg Vine says the towns of Athol, Templeton, Winchendon, and Gardner have a population of 50-60,000 people and stations need to be included in Athol and Gardener to increase ridership.

Makaela Niles (MassDOT) says this will be further discussed as part of module 3.

Barbara Alexander says the Study team left out some information from the existing population trends and that those locked into the Boston housing market would benefit the most from this rail service. Barbara also says that there are many events and attractions, including MASS MoCA, could further attract people west.

Anna Barry (HNTB) says these attractions and other events have been considered.

Ross Jacobs asks if it is feasible to begin service under the lower-cost alternative and make upgrades to continue reducing travel times.

Anna Barry (HNTB) says phasing in transportation improvements is a possibility.

Lynne Kellner asks how a billion-dollar budget for this Study compares to the MassDOT budget.

Anna Barry (HNTB) says comparisons are made to projects in the region and capital cost comparisons are shared for the initial service alternatives, however these are somewhat expensive because the improvements that need to be made, and the ridership numbers are not as high as areas that are densely populated. She says a lot is dependent on the benefits.

Representative Aaron Saunders says the 4.3-mile extension of the Green Line cost over $2 billion and suggests that this is a modest investment into the Western part of the state and as the other options are considered, these communities should be prioritized. He also says that while there are limitations to models, the housing issues and Green Line extension costs should be considered.

5. *Module 2: Evaluation of Phase 1 Alternatives by Paul Nelson, HNTB*

Paul Nelson (HNTB) reviews Study goals which are supporting economic development along the Northern Tier corridor, promoting transportation equity, and minimizing impacts on public health and the environment from transportation and the various impacts of the Study. He also lists the possible elements that could be measured, as well as the Study team's evaluation of mobility and access followed by partial lists of attractors in North Adams, Greenfield, Fitchburg, and North Station.

Paul Nelson (HNTB) reviews the following:

- Economic Impact: Direct, Indirect, and Induced:
  - Potential benefits to individuals and business:
    - Potential savings by switching to rail travel
    - May provide access to jobs in new regions and cities
    - Could create new jobs
    - May attract new residents to the region, who patronize businesses
    - Potential increase in property values
  - Potential Benefits to Towns and Cities:
    - Transit-Oriented Development (TOD) could lead to new housing, retail, and office space
    - May increase local tax base
    - Could preserve natural resources by reducing pressure for green field development

Paul Nelson (HNTB) reviews the evaluation of the economic impact of the Study. He notes that the estimated transportation costs (auto trip costs and parking costs) for the lower build range from $1.24 million to $3.29 million, while the higher build costs range from $1.92 million to $5.19 million. To calculate the primary construction impacts, the full project cost estimates for each concept have been fed into REMI econometric model and the economic impacts include information on outputs, income, and employment estimates per year of construction for the lower and higher builds. Examples such as the Downeaster in Massachusetts, New Hampshire, and Maine as well as the Hartford Line are used to convey different economic impacts.

Paul Nelson (HNTB) reviews the evaluation of social equity and fairness of the Study, which include access for zero car-households and environmental justice communities. He also explains the evaluation of impacts on rail capacity and the differences between freight operations (the RTC model has calculated an average freight train delay of about ten minutes) and passenger operations (Northern Tier trains are scheduled to run between the intervals of MBTA commuter rail trains and not expected to impact MBTA operations).

Paul Nelson (HNTB) reviews the evaluation of impacts on environmental and cultural resources. Constraints could include wetlands and waterways, FEMA designated floodplains, open space, and recreational parklands. Both alternatives limit improvements to within the existing right-of-way, minimizing potential impacts. He reviews an example of a potential layover site in North Adams to show these potential impacts.

Paul Nelson (HNTB) reviews the evaluation of cost effectiveness. The standard for comparison across scenarios is cost per mile (total project costs divided by length of the project) and cost per rider (total project cost divided by total number of riders). Further, the operating and maintenance costs per rider are calculated by annual operating costs divided by total number of riders.

Paul Nelson (HNTB) reviews safety and air quality. The Study team anticipates a reduction of vehicle miles traveled (VMT) for each investment alternative.

Paul Nelson (HNTB) compares the Phase 1 alternatives. Similarities include coverage area and populations served, estimated environmental impacts, and estimated passenger rail impacts. Differences include travel time and estimated ridership, the extent of economic impacts, estimated cost effectiveness, estimated freight rail impacts, and estimated VMT reduction.

6. *Public Discussion by Makaela Niles, MassDOT (Project Manager), and Paul Nelson, HNTB*

Emma Weiskopf says she is a physician and has lived in western Massachusetts for 15 years. She says it is difficult recruiting people who finish their residency in Boston because it is difficult to travel to the western part of the state without using a car. Further, she has accepted a job in Seaport and needs to travel to Wachusett and take the train, so she is interested in seeing this project succeed.

Greg Roach says the major benefits will be seen in future generations as the infrastructure and the users find the actual potential.

Carl McKinney says the project should also think of connecting to Albany, New York and that North Adams is not directly connected to Albany, so this would increase connectivity to other areas of New York.

Mark Shapp asks if the Study team could be more specific as to the proposed station location and layover facilities at North Adams.

Paul Nelson (HNTB) says there is an area east along the rails from the historic station that was identified based on previously having railroad-related uses. The Study team is identifying the potential location and any potential environmental impacts, but there is no preferred location or configuration for it at this point of the study.

Makaela Niles (MassDOT) says that at this conceptual level, the Study team is reviewing the facilities needed to have the initial service alternatives developed so far and these will be updated as the Study progresses.

Representative Tricia Farley-Bouvier says she agrees with her colleagues' comparisons of this Study's estimated costs and the costs of the Green Line extension. She cautions against the Study teams' metrics of zero-car households, as these metrics do not always apply to western Massachusetts. She mentions that other metrics should also be considered and the ways they are being applied to this project area.

MJ Adams asks if the cost per rider estimates is cost per rider per year.

Paul Nelson (HNTB) says the cost would increase with inflation for operating costs and is cost per year. The cost per rider based on the capital costs and this is the estimated year ridership for the total project cost.

Andy Hogeland says the ridership information in Phase 1 only took data from Massachusetts and missed people from Vermont, New Hampshire, or eastern New York. He asks that there is a capture zone that crosses state lines for ridership populations and says people coming west from Boston can visit more places and events that are slightly further than the proposed train stations.

Paul Nelson (HNTB) says the list of attractors is not meant to be comprehensive. The Study team will ensure it is clearer how these are being considered and what type of events there are and how they translate into ridership estimations.

7. *Module 3: Looking Ahead to Phase 2 by Makaela Niles, MassDOT (Project Manager), and Anna M. Barry, HNTB*

Makaela Niles introduces Module 3, which is an opportunity to provide input on service characteristics that could be included in the additional four service alternatives. The characteristics include stations, coverage area, service structure, frequency of service, span of service, travel time between stations, and physical improvements followed by ranges of options for each.

Makaela Niles (MassDOT) reviews the stations and coverage area:

- Potential Alternative for Phase 2:
  - An alternative that adds station stops at Orange, Gardener, Ayer, and Porter Square
  - An alternative that adds stations stops at Athol, Ayer, and Waltham
- Other Options:
  - Station stops could be included in Williamstown, Charlemont, Shelburne Falls, Miller's Falls, Erving, Baldwinville, North Leominster, and or Littleton Route 495.
  - There is an extension of service to Albany on existing lines via Schenectady.
  - There is an extension of service to Albany on new alignment through Cohoes and Troy.

Makaela Niles (MassDOT) reviews the service structure, frequency, and span of service. An image is referenced to show potential options related to how the service could be structured, whether it may include direct service, transfers, or a blend of express and local service, and how frequent it could be.

- Potential Alternative for Phase 2:
    - An alternative that eliminates Northern Tier service at Fitchburg, allowing transfers to MBTA Commuter Rail for trips to Boston North Station.
    - An alternative that provides seven daily trains.
- Other Options:
    - Terminates Northern Tier service at an intermediate station between Fitchburg and Boston.

Makaela Niles (MassDOT) mentions potential tradeoffs that would need to be considered. For example, direct service may be more desirable and also requires more equipment, or higher frequency can provide more options for travel and also has impacts on cost and potential conflicts with freight and passenger service along the corridor.

Makaela Niles (MassDOT) reviews the travel time between stations and physical improvements by referencing an image that shows how speeds can be improved as a result. These improvements include new track alignments in key areas or new sidings.

- Potential Alternative for Phase 2:
    - An alternative that electrifies the rail.
    - An alternative that constructs a new alignment between Gardener and Fitchburg.
- Other Options:
    - Double track the whole Northern Tier corridor line.
    - New alignment through Athol and Royalston.

Makaela Niles (MassDOT) mentions potential tradeoffs that would need to be considered. For example, more physical improvements can potentially decrease travel time for riders and requires more capital investment.

8. *Public Discussion by Makaela Niles, MassDOT (Project Manager), Anna Barry, HNTB, and Paul Nelson, HNTB*

Andy Hogeland says the Study team should investigate stops in Charlemont and Williamstown for seasonal events. These entities record where customers come from, and this information could potentially be made available.

Marcus Graly says there are a lot of people that live in Gardner and Athol with various attractions that could benefit from stops.

Emily Crowley says a service branch from Greenfield to Amherst would be beneficial for students.

Barbara Alexander says reliability is most important.

Carl McKinney says there are rights-of-way of the existing track to Mechanicsville and at the last public meeting, one of the panelists indicated the rights of way were still there to Rensselaer. He also says that there is a segment that goes through southern Vermont and to be inclusive and economically integrated, Bennington and Albany should be brought in. There is an opportunity for Massachusetts to collaborate with other states, especially if there is federal funding available.

Françoise Hatte says it is important that there are fast and frequent trains to make it possible to travel to Boston without needing to drive and park.

Representative John Barrett says the cost of the project should not increase. He thinks one of these two alternatives could potentially lead to the success of this project. He is unsure if a line to Albany exists currently, so it might be useful to prioritize this and notes the Governor and other representatives are invested in this and there are commitments in funding from legislature for Northern Tier.

Sam Seidel likes the idea of stops in Orange and in Porter Square in Cambridge, and the idea of expanding consideration to including Albany, NY and the Amtrak north-south route running through Greenfield.

Nicholas Horton says adding additional stations would be a priority and the potential to connect to Albany is an exciting possibility.

Mark Shapp says the old Boston mainline from Johnsonville down to Troy is gone. The only way to go to Albany Rensselaer Station would be through Mechanicville Yard, out the west end, and on the Amtrak line to Schenectady and back to Albany.

Senator Joanne Comerford says as the Study progresses, she would love to see the Study consider longer-term possible economic or population growth along the northern tier spurred by passenger rail as a stimulus. She also says she understand the economic impact of the direct construction but would love to see something broader over time.

Kristen Elechko (Western Massachusetts Regional Director for Senator Ed Markey) thanks everyone for producing this public workshop. She appreciates being a part of the presentation, the leadership of elected officials, and the public comments and will remain engaged.

Marcus Graly asks that Porter Square be included as a possible station stop and says the there is a lot of development in Kendall, and it is much easier to get there on the Red Line from Porter than it is to get there from North Station, increasing the potential ridership.

Will Quale says module 3 addressed his earlier questions in the discussion. He strongly encourages and will advocate for future opportunities for many more stations with frequent short trainsets making connections. He also says Millers Falls would become his local station and that this is a great location.

Senator Joanne Comerford asks what the schedule is for the Study after this workshop.

Makaela Niles (MassDOT) says as part of the next steps, the two initial alternatives will be refined, and four additional alternatives will be developed based on the feedback received and be assessed using the evaluation criteria. The Study is expected to be completed in the Spring.

Elijah Witkowski-Despres agrees with the addition of a Porter Square stop.

Lynne Kellner asks how much has been forecasted for federal input for federal funding towards this project.

Makaela Niles (MassDOT) says the two alternatives will be refined and four other alternatives will be developed and assessed based on the evaluation criteria. The draft final report will be released for public comment before it is finalized and will include possible funding opportunities.

9. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) presents the next steps for the Study goals and objectives. She mentions the two alternatives will be refined and four other alternatives will be developed and assessed based on the evaluation criteria. The draft final report will be released for public comment for a month before it is finalized. Makaela Niles (MassDOT) thanks members of the public for attending and sharing their comments and questions and encourages attendees to visit the Study website to submit additional comments or questions or sign up for Study updates and monthly e-newsletter. The materials from this meeting including the video recording and meeting summary, will be made available on the Study website.

Northern Tier Passenger Rail Study Public Workshop

MassDOT/Study Team:

- Makaela Niles – MassDOT
- Anna Barry – HNTB
- Paul Nelson – HNTB
- John Orrison – HNTB
- Karl Clayter - HNTB
- Paige Sopher – HNTB
- Sara Stoja – HNTB
- Andreas Aeppli – Cambridge Systematics
- Dan Tempesta – Cambridge Systematics

Interpreters:

- Kym Detato – American Sign Language
- John Roberts – American Sign Language
- Megan Speed – CART

Public Attendees:

1. Aaron Saunders – MA State Representative
2. Adrienne Nunez
3. Alan Butler
4. Alex Herchenreder
5. Alex Wang
6. Alice Bojanowski
7. Alice Goldfarb
8. Alicia Canary
9. Allen Pope
10. Allison Fippinger
11. Andrew Achenbach
12. Andrew Fitch
13. Andy Hogeland
14. Anne McKinnon
15. Barbara Alexander
16. Bee Jacque
17. Bella Levavi
18. Ben Heckscher
19. Ben Svenson
20. Bill Dacey
21. Bob Armstrong
22. Brad Harris
23. Brendan Read
24. Brian Parkinson
25. Brian Winchendon
26. Bridget Sullivan
27. Brigham Stevenson
28. Brooke Burrows
29. Bruce Fogwell
30. Bryan Smith
31. Caitlin von Schmidt
32. Cameron Dunbar
33. Carl McKinney
34. Carolyn Sellars
35. Carter Jimmis
36. Cathy Kristofferson
37. Christopher Silvia
38. Clark Semon
39. Claudia Palframan
40. Clete Kus
41. Clint Richmond
42. Constance Peters
43. Dallas Ducar
44. Dana Roscoe
45. Daniel Bigda
46. Daniel Raine
47. David Brock
48. David Cohen

49. David Kulp
50. David Nixon
51. Dee Brochu
52. Dianne Olsen
53. Drew David
54. Edward Bates
55. Edward Damon Jr
56. Elijah Witkowski-Despres
57. Elizabeth Giannini
58. Elizabeth Murphy
59. Emily Bayard
60. Emily Crowley
61. Emily Hodos
62. Emma Weiskopf
63. Eric Kerns
64. Faith Williams
65. Françoise Hatte
66. Garrett Postema
67. Garrison Taylor
68. Gary Bartholomaus
69. George Kahale
70. George Waldmann
71. Greg Roach
72. Greg Vine
73. Gregory Cox
74. Gretchen Heinle
75. Hannah Holleman
76. Heather Williams
77. Hope Nilsson
78. J. B. Mack
79. Jacquelyn Goddard
80. James Garzon
81. James Sheehan
82. Jay Flynn
83. Jeannette Smith
84. Jennifer Bernard
85. Jennifer West
86. Jill Behringer
87. Joanne Comerford – MA State Senator
88. Joe Kurland
89. Joe Zissman
90. John Barrett – MA State Representative
91. John Cronin – MA State Senator
92. John Edwards
93. John Garrett
94. John Hostage
95. John Kyper
96. Jojo Finfer
97. Joseph Arabia
98. Joseph Barr
99. Joseph DiMarino
100. Judith Atkins
101. Judy Waters
102. Julian Hartmann-Russell
103. K K
104. Katerina King
105. Kevin Kump
106. Kevin Sullivan
107. Kim Shand
108. Kristen Elechko - Western Massachusetts Regional Director for Senator Ed Markey
109. Kristofer Munroe
110. Laura Hanson
111. Leo Quigley
112. Linda Dunlavy
113. Linda Maloney
114. Lisa Blackmer
115. Lisa Gustavsen
116. Lucia Folet
117. Lynn Valle
118. Lynne Kellner
119. Malcolm Ragan
120. Marcel LaFlamme
121. Marcus Graly
122. Mariah Kurtz
123. Marie Harpin
124. Mark Shapp
125. Marta Nover
126. Mary Holtorf
127. Mary Savarese
128. Mary Westervelt
129. Matt Lord
130. Matthew Cooperman
131. Matthew Minihan
132. Matthew Spurlock
133. Meredith Slesinger
134. Michael Arnold
135. Michael Eriquezzo
136. Michele Spring-Moore
137. Mindy Domb – MA State Representative

138. MJ Adams
139. Avie Kalker
140. Nancy Hazard
141. Natalie Blais – MA State Representative
142. Nicholas Horton
143. Nick Licata
144. Nicole Fonsh
145. Nolan Buonomano
146. Patricia Gerry-Karajanes
147. Pete Cooke
148. Peter Lowitt
149. Ralph Brill
150. Rana Al-Jammal
151. Rauley Caine
152. Rich Remsberg
153. Robert Malnati
154. Robin Brickman
155. Ron Hult
156. Ross Jacobs
157. Roy Nascimento
158. Sam Seidel
159. Sandra Thomas
160. Sarah Reynolds
161. Sarah Robertson
162. Sarah Vallieres
163. Scott Galbraith
164. Scott Stafford
165. Shaw Izikson
166. Sheera Hefter
167. Sophie Michaux
168. Susan Templeton
169. Tammy Daniels
170. Thomas Gelb
171. Thomas Matuszko
172. Timothy Dolan
173. Tom Bernard
174. Travis Condon
175. Trevor Beauregard
176. Tricia Farley-Bouvier – MA State Representative
177. Wes Coates
178. Wil Neeley
179. Will Quale
180. William Dwyer
181. William Keller
182. Zachary O'Brien

Northern Tier Passenger Rail Study Working Group Meeting #3
Thursday, October 19, 2023, 1:00 PM
Held Virtually Via Zoom

Meeting Summary

The Northern Tier Passenger Rail Study Working Group workshop met for the third time on October 19, 2023. At this meeting, the Study team shared an overview of the study's background, reviewed the public workshop, presented the development and evaluation of the Phase 2 alternatives, and garnered feedback.

Meeting Notes

1. *Welcome, Ground Rules, and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the meeting and informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself, thanks all participants, and explains the meeting notes and procedures including how to participate. She reviews the agenda for the meeting.

2. *Study Overview by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) explains the Study overview and process, which includes the following:
- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory, and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

The Study team presents the goals and objectives for the Study, which are to:
- Support economic development along the Northern Tier corridor
- Promote transportation equity
- Minimize the impacts on public health and the environment from transportation

3. *Public Workshop Review by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) reviews the two-phase alternatives development process. Phase 1 includes two initial alternatives: a lower investment option and a higher investment option, each with a one-seat ride from North Adams to Boston North Station, four stations, and five trains per day. The initial alternatives assume the accommodation of commuter schedules and freight trains, diesel trains with Amtrak-type equipment, and no modification or investment in MBTA infrastructure. The level of investment was the main differentiator between the two alternatives, as the higher investment includes more track infrastructure improvements.

An evaluation of the two initial alternatives found that the higher investment level allowed for travel time reduction of more than one hour both eastbound and westbound compared to the lower investment level. Anna M. Barry (HNTB) explains the relationship between ridership, cost, travel time, and associated economic and environmental benefits and impacts.

Anna M. Barry (HNTB) reviews the feedback received during and following the public workshop which helped inform the development of the Phase 2 Alternatives.

The Study team was asked to:

- Consider additional stops
- Evaluate a connection to Albany
- Consider seasonal attractors
- Consider potential upgrades to support higher speeds

Comments and questions related to ridership projections and cost estimation were also received.

Paul Nelson (HNTB) explains that the initial ridership estimation process for the Phase 1 evaluation was a three-step process based on StreetLight Data origin-destination trips, which were applied to observed MBTA Commuter Rail boardings. Then, using a travel time comparison to account for the trip distance, the ridership was estimated. He then reviews the updated, four-step ridership estimation process including the incorporation of travel time by rail compared to driving. Daily trip origins by corridor segment from 2019 StreetLight Data are presented and catchment areas around stations are also described as a factor in estimating ridership.

The cost estimation process is reviewed. Cost categories include construction cost, acquisition of real estate for the right of way, a civil system contingency at 0% design, vehicle or train costs, escalation for future costs, and engineering and permitting.

The Northern Tier Passenger Rail Study is at a pre-design stage, therefore contingency costs account for unknown but expected elements of the project. The cost estimates are based on material, equipment, and labor costs from recent railroad construction projects in Massachusetts and surrounding states. The Study team refined the cost of track components, incorporated a credit for recycled rail and materials, and updated the rolling stock estimates. Station estimates reflect station accessibility features.

4. *Phase 2 Alternatives Development and Evaluation by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) explains that, based on input, four additional service alternatives were developed as part of Phase 2. Each is built upon the higher level of investment from the Phase 1 alternatives.

- Alternative 3 – Electrified Service – Includes an overhead catenary system and associated rolling stock. The cost of electrifying the rail service is discussed. A new double track in Charlemont is required for freight service to continue. Tracks are to be upgraded from Class 3 to Class 4. Electrification is overhead. Crossings need upgrades. Some bridge rehabilitation is necessary. Signal replacement and Positive Train Control are proposed improvements. Stations at Athol, Ayer, and Porter Square, Cambridge are added. A layover facility in North Adams is also proposed.
- Alternative 4 – Full Local Service – The cost of full local service to include more stations in Shelburne Falls, Athol, Gardner and Porter Square, Cambridge is discussed. New double track is proposed in Buckland. Tracks are proposed to be upgraded from Class 3 to Class 4. Upgrades to crossings and bridge rehabilitation are also proposed. Signal replacement and Positive Train Control is anticipated. A layover facility in North Adams is also proposed.
- Alternative 5 – Albany Extension – From North Adams, service is extended to Schenectady and Albany. Double track is proposed in Charlemont, Stillwater, NY and Clifton Park, NY. Additional improvements proposed include grade crossing upgrades, bridge rehabilitation, signal replacement and Positive Train Control implementation. North Adams layover is not included, as facilities in Albany are assumed to be utilized.
- Alternative 6 – Northern Tier Rail Link – Includes a connection in Fitchburg from the MBTA Commute Rail to Northern Rail Tier train service. Station stops added include Athol. Tracks are to be upgraded from Class 3 to Class 4. Crossing need upgrades. Some bridge rehabilitation is necessary. Signal replacement and Positive Train Control are implemented. North Adams is proposed to have a layover.

Total Project Cost per Route Mile is discussed for Alternatives 1 through 6. Project construction costs for the Hartford Line and South Coast Rail are presented for comparison purposes.

Paul Nelson (HNTB) explains that ridership is related to travel time and a reduction in travel time increases ridership. Alternative 3 (Electrified Service) and Alternative 4 (Full Local Service) generate the highest ridership.

5. *Working Group Discussion by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) summarizes the proposed alternatives and asks for questions and comments from the Working Group. She reviews the protocol for asking questions and/or leaving comments.

Senator Jo Comerford thanks the Study team for the presentation. She also expresses excitement about the local stops and appreciation for the combination of climate readiness. She mentions the public meeting being held the following week and the importance of building public awareness.

Representative John Barrett requests information on the cost of the North Adams loading station.

Anna M. Barry (HNTB) replies by estimating $5 million to $6 million, which developing level boarding for accessibility. Anna Barry notes that the highest cost alternative that includes electrification is approximately $3 billion, and the lower cost alternative is approximately $1.5 billion.

Robert Malnati requests clarification of the ridership estimates presented.

Paul Nelson (HNTB) explains that the ridership numbers presented accounted for the range of ridership estimated for the six alternatives studied. Alternatives 3 and 4 are represented by the higher end of the ridership estimate. The lower ridership estimate represents Alternative 6, which also has the longest travel time.

Robert Malnati asks about whether the Lake Shore Limited service was taken into consideration.

Paul Nelson (HNTB) says that ridership for the Lake Shore Limited was also studied and mentions that the Downeaster ridership was studied for comparison for travel beyond the metropolitan Boston area to identify potential ridership in places like Greenfield and intermediate stations like Athol.

Linda Dunlavy requests that the ridership in the presentation be clarified before the public meeting.

Paul Nelson (HNTB) says that the range can be provided to help people understand how the numbers relate to each other.

Representative Natalie Blais thanks the Study team for the analysis and asks about whether the cost estimates were based on contracting out to a private entity or based on using the railroad to do the work.

Anna M. Barry (HNTB) says that cost estimates were based on recent rail construction projects and that often the railroad will use its own forces if they have them.

Representative Natalie Blais asks about the rolling stock included in the cost estimates, including who would own the rolling stock, would it include purchasing new vehicles, and how those cost estimates were developed around vehicles.

Anna M. Barry (HNTB) says the cost estimates include the capital cost of purchasing equipment and that the assumption is that Amtrak would be the operator. She notes that the Commonwealth, as the sponsor of the service, would be responsible for the various capital costs and mentions that, in order to look at the true capital cost of the project, it was treated as if the Commonwealth was buying the equipment.

Andreas Aeppli (Cambridge Systematics) states that the cost is based on the current Amtrak procurement for corridor trains.

Representative Natalie Blais inquires about whether the assumption is that this would be an intercity rail service.

Andreas Aeppli (Cambridge Systematics) says that intercity rolling stock would be used, as opposed to commuter equipment, and Anna M. Barry (HNTB) states that the service is to be considered intercity rail.

Representative Natalie Blais asks about whether the cost estimates included the full construction of high-level platforms and whether these could be phased.

Anna M. Barry (HNTB) explains that the Study includes the cost of full, high-level platforms and assumed a retractable platform edge in order to include the full cost of accessibility, while recognizing that phasing is possible.

Representative Natalie Blais says it might be helpful to understand the cost of mini high platforms would be and inquires about assumptions on electrification east of Fitchburg. Representative Natalie Blais also asks about an estimated timeline for Northern Tier.

Anna M. Barry (HNTB) says that a construction estimate was used and the impact funding has on the timeline. She also explains that electrification is a big endeavor and that the Study assumes that the service east of Fitchburg is electrified, as the Study did not want to burden the Northern Tier project with the cost of electrifying east of Fitchburg. Anna M. Barry (HNTB) mentions that electrification could take place in phases and that dual mode rolling stock could potentially be utilized.

Representative Natalie Blais asks about the proposed track reconfiguration west of Shelburne Falls.

Anna M. Barry (HNTB) states that double track allows for freight and passenger trains to pass each other and that, because the railroad is largely single track now, additional track needs to be provided for the trains to pass each other and to accommodate the schedule.

Paul Nelson (HNTB) adds that it is assumed that double track could be added within the existing right-of-way.

Representative Natalie Blais asks about the number of freight trains currently operating along the corridor.

Anna M. Barry (HNTB) says that approximately 40 trains per week and Andreas Aeppli (Cambridge Systematics) adds that volumes between Fitchburg and Greenfield differ from volumes west of Greenfield.

Representative Natalie Blais suggests that ridership projections be included on the Alternative slides and asks if the study has considered a mix of straight-through westbound trips and some that connect to the MBTA Fitchburg Line.

Anna M. Barry (HNTB) says that the Study has not considered that alternative.

Representative Natalie Blais requests more information on induced economic development.

Paul Nelson (HNTB) states that estimated job creation and value added from the capital construction costs and mentions that the benefit-cost analysis will include other economic benefits such as increased real estate values. He also explains the relationship between capital costs, community benefits, and job creation.

Senator Jo Comerford asks what relationship Keolis would have with the Northern Tier Rail service east of Fitchburg.

Anna M. Barry (HNTB) says that service alternatives were developed to avoid impacting the MBTA Commuter Rail trains operated by Keolis.

Senator Jo Comerford mentions the benefit of connecting to trains in the east and suggests that for the public meeting, information on rough timelines of implementation, climate, and economic impacts for all of Massachusetts could be useful to present. Senator Jo Comerford asks about public outreach strategies for the public meeting that could be used and shared.

Makaela Niles (MassDOT) states that the next task of the study will address implementation, funding opportunities, and timelines. She also asks for participants to share the information on the website with the public and states that all are invited to attend the public meeting scheduled for Thursday, October 26, 2023 at 6:00 PM. She shares that registration information and a flyer are available, as well as social media posting.

Representative John Barrett inquires about when the meeting materials may be available for viewing.

Makaela Niles (MassDOT) that the presentation will be posted to the study website once it is made accessible and is anticipated to be posted in advance of the public meeting.

Representative Natalie Blais asks if the presentation will be sent to the Working Group.

Makaela Niles (MassDOT) confirms and says that the process will be expedited to allow enough time for review of the materials in advance of the public meeting.

6. *Public Comment by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) opens the discussion up to members of the public in attendance for public comment and reminds the public that additional questions and comments can be shared on the study website.

Barbara Alexander asks if the alternatives could be ranked and presented from the simplest and cheapest alternative to be implemented and built to the most complex and expensive alternative. She asks about the timeline and feels the public would also be well served to know the timeline of implementation of the alternatives.

Makaela Niles (MassDOT) states that the next steps implementation and timeline will be discussed in the next task. She reads comments from Shaun and Eric related to the inclusion of Athol as a proposed stop.

Richard Rudolf would like to know and feels the public needs to know the timeline. He states that Alternative 6 with a stop in Fitchburg with an expectation for riders to then use MBTA service is inconvenient and will take more time.

Anna M. Barry (HNTB) recognizes Richard's comment and agrees that the need for a connection reduces the estimated ridership for Alternative 6, but that in a planning study an array of alternatives are examined.

Makaela Niles (MassDOT) reads a question from Fay who asks about travel times from Athol to North Station and whether people who live in Athol may be willing to commute to a Greenfield station if there is no station in Athol.

Paul Nelson (HNTB) discusses testing the impact of stations on ridership, and explains that mobility benefits increase as stations increase.
Makaela Niles (MassDOT) reads a comment from Fay related to ridership equity for students and individuals dependent on public transportation from a financial perspective.

Makaela Niles (MassDOT) reads a question from Trevor who asks what is meant by full local service.

Anna M. Barry (HNTB) responds by explaining the full local service features the highest number of stations along the corridor and includes North Adams, Shelburne Falls, Greenfield, Athol, Gardner, and Fitchburg.

Linda Dunlavy asks if the ridership and cost methodologies changed when re-evaluating Alternative 1 and 2.

Paul Nelson (HNTB) states that the cost of equipment changed, and ridership increased.

Makaela Niles (MassDOT) reads a comment from Paula who expresses gratitude for the work on the project and an interest in the potential for phasing.

Makaela Niles (MassDOT) states that this will be included as part of the next steps of the Study.

Makaela Niles (MassDOT) reads a question from Jared about considering additional ridership from transfers for north and south lines as a source of ridership.

Paul Nelson (HNTB) states that the model doesn't count on transfers by rail outside of the catchment areas. Andreas Aeppli (Cambridge Systematics) states that other markets were not studied, including the New York market.

Makaela Niles (MassDOT) reads a comment from Artie that existing track and rail lines should be used and favors Alternative 5 and electrification for its effect on climate change. She also reads a question from Barbara who asks about whether the unreliability of the Lake Shore Limited schedule is reflected in the ridership estimates.

Andreas Aeppli (Cambridge Systematics) says that it was not taken into account from an analysis standpoint.

Makaela Niles (MassDOT) reads a question from Leo who asks how seasonal draws were reflected in the analysis.

Paul Nelson (HNTB) states that ridership was analyzed based on annual data and mentions that seasonal draws add peaks and valleys to the ridership.

7. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) thanks the Working Group and members of the public for attending and sharing comments and questions and encourages attendees to visit the website to submit additional comments or questions or sign up for updates. The materials from this meeting will be made available on the Study website.

Northern Tier Passenger Rail Study Meeting #3 Attendees

MassDOT/Study Team:

- Makaela Niles – MassDOT
- Anna M. Barry – HNTB
- Paul Nelson – HNTB
- Sara Stoja – HNTB
- Andreas Aeppli – Cambridge Systematics
- Julie Callahan – City Point Partners

Working Group Members & Alternates:

1. Liz Quigley – Office of Congressman Richard Neal
2. Jo Comerford – State Senator
3. Natalie Blais – State Representative
4. John Barrett – State Representative
5. Bruno Fisher – Montachusett Regional Transit Authority
6. Glenn Eaton – Montachusett Regional Planning Commission
7. Linda Dunlavy – Franklin Regional Council of Governments
8. Marco Turra – CSX Transportation
9. Robert Malnati – Berkshire Regional Transit Authority
10. Thomas Matuszko – Berkshire Regional Planning Commission
11. Roy Nascimento - North Central Massachusetts Chamber of Commerce

Public Attendees:

1. Amy Cahillane
2. Ana Devlin Gauthier
3. Andy Hogeland
4. Antoinette Cariddi
5. Artie Carpenter
6. Barbara Alexander
7. Ben Heckscher
8. Beth Giannini
9. Brad Harris
10. Brian Parkinson
11. Charlotte Minsky
12. Chris Klem, MassDOT
13. Clete Kus
14. Dawn Nims
15. Donna Riggs
16. Eric Smith
17. Fay Hsieh-Lewis
18. George Kahale
19. Jared Cowing
20. Jessye Deane
21. Juno Pelczar
22. Kali Puppolo
23. Kate Richardson
24. Kiara White
25. Leo Quigley
26. Mallory Sullivan
27. Mariah Kurtz
28. Mark Anders
29. Paula Consolini
30. Richard Rudolph
31. Shaun Suhoski
32. Soren Henry
33. Susan Templeton
34. Travis Condon
35. Trevor Beauregard
36. Walker Powell

Northern Tier Passenger Rail Study Public Information Meeting #2

Thursday, October 26, 2023, 6:00 PM
Held Virtually Via Zoom

Meeting Summary

The Northern Tier Passenger Rail Study team held a Public Information Meeting on October 26, 2023. At this meeting, the Study team shared an overview of the study's background, reviewed the public workshop, presented the development and evaluation of the Phase 2 alternatives, and garnered feedback.

Meeting Notes

1. *Welcome, Ground Rules, and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the meeting and informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself, thanks the public and the members of the working group in attendance and explains the meeting notes and procedures including how to participate. She reviews the agenda for the Public Information meeting, which includes an overview of the study, public workshop review, Phase 2 alternative development and evaluation working group discussion, public comment and participation, and finally next steps.

2. *Study Overview by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) reviews the Study background and process, which includes the following with each task building on the previous:

- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

Makaela Niles (MassDOT) explains the Study goals and objectives as supporting economic development along the Northern Tier Corridor, promoting transportation equity, and minimizing the impacts from transportation on public health and the environment.

3. *Public Workshop Review by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) reviews the two-phase alternatives development process presented in January of 2023 and states that the public feedback on the initial alternatives led to the development of the Phase 2 Alternatives. Phase 1 includes a lower investment option and a higher investment option for a one-seat-ride from North Adams to Boston North Station, with the following assumptions: four stations, five trains per day, the right of way will be used by both commuter trains and freight trains, dwell time at stations will be two minutes per Amtrak's scheduling standard, train locomotives will be diesel with Amfleet passenger cars, and no modifications will be made to MBTA infrastructure.

The lower investment option included minimum signal improvements and some trackage additions to support meet-and-pass locations. The higher investment option includes more track and signal infrastructure improvements.

Based on an evaluation of the two levels of investment, the higher investment allows for travel time reduction of more than one hour. The lower investment provided a four-hour travel time while the higher investment resulted in just under a three-hour travel time. Higher ridership is a function of reduced travel times. While higher investment creates more transportation costs per rider, lower annual operating costs are realized due to higher ridership. The higher investment also resulted in greater positive environmental impact with a greater vehicle miles travel reduction.

Anna M. Barry (HNTB) reviews the feedback from the public workshop that led to the Phase 2 alternatives.

The study considered:

- Additional stops
- A connection to Albany
- Seasonal attractors
- Potential upgrades to support higher speeds
- Ridership projections and cost estimation questions

Paul Nelson (HNTB) reviews the initial ridership estimated process and how it changed for Phase 2 of the study. He explains that the initial ridership estimation process for the Phase 1 evaluation was a three-step process that started with a comparison between observed MBTA Commuter Rail boardings and origin-destination trip data along the Northern Tier corridor. The ridership estimates then looked at the impact of travel times on ridership for similar intercity service. These estimates are then used to estimate the potential ridership of the initial service alternatives.

Paul Nelson (HNTB) explains the updated, four-step ridership estimation process used for Phase 2, which uses a comparison of transit travel time to the auto travel time between the same destinations. The estimation model was also adjusted to reflect the less frequent intercity service. Recent travel patterns for intra-Corridor trips on the Downeaster are also applied to estimate intra-corridor, non-Boston-based travel along the Northern Tier. He reviews the trip activity data for the corridor. Catchment areas around potential stations are also described as a factor in estimating ridership.

Paul Nelson (HNTB) reviews the cost estimation process. Cost categories include construction cost, acquisition of real estate for the right of way, a civil system contingency at 0% design, vehicle or train costs, escalation for future costs, and engineering and permitting.

The Northern Tier Passenger Rail Study is at a pre-design stage and, as a result, contingency costs account for unknown but expected elements of the project. The cost estimates are based on material, equipment, and labor costs from recent railroad construction projects in Massachusetts and surrounding states. Refinements were made to the cost of track components, the consideration of recycled rail and materials, and rolling stock estimates. Station estimates reflect station accessibility features.

4. *Phase 2 Alternatives Development and Evaluation by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) presents the Phase 2 service alternatives that were developed based on input received on the two initial alternatives. All four proposed alternatives in Phase 2 build upon the improvements incorporated into the higher infrastructure investment alternative presented in Phase 1.

Alternative 3 – Electrified Service. Overhead catenary system with electrified rolling stock. A new double track in Charlemont is included. Tracks are to be upgraded from Class 3 to Class 4. Electrification is overhead. Crossings need upgrades. Some bridge rehabilitation is necessary. Signal replacement and Positive Train Control are proposed. Station stops are added in Athol, Ayer and Porter Square, Cambridge. North Adams is proposed to have a layover facility.

Alternative 4 – Full Local Service. Full local service proposes to include dditional station stops in Shelburne Falls, Athol, Gardner, and Porter Square. New double track is needed in Buckland. Tracks are to be upgraded from Class 3 to Class 4. Crossings need upgrades. Some Bridge rehabilitation is necessary. Signal replacement and Positive Train Control are proposed. North Adams is proposed to have a layover.

Alternative 5 – Albany Extension. From North Adams, service is extended through Schenectady and Albany. Other stations include Greenfield, Fitchburg, Porter Square, and North Station. Double track is required in Charlemont, and Stillwater and Clifton Park NY. Additional improvements include grade crossing upgrades, bridge rehabilitation, signal replacement, and Positive Train Control implementation. North Adams layover is not included, as facilities in Albany are assumed to be utilized.

Alternative 6 – Northern Tier Rail Link. This alternative includes a connection in Fitchburg from the MBTA Fitchburg Line to the Northern Tier Rail service. Stations include North Adams, Greenfield, Athol, and Fitchburg. Tracks are to be upgraded from Class 3 to Class 4. Crossings need upgrades. Some bridge rehabilitation is necessary. Signal replacement and Positive Train Control are proposed. North Adams is proposed to have a layover.

Total Projected Costs per Route Mile are discussed for Alternatives 1 through 6. Additional project construction costs for the Hartford Line and South Coast Rail are presented for comparison purposes.

Anna M. Barry (HNTB) notes that ridership is related to travel time, as a reduction in travel time increases ridership. Travel time for Alternatives 3 through 6 shows a reduction of about one hour between North Adams and Boston compared to Alternative 1. Environmental impacts and passenger rail impacts are estimated to be minimal. Freight rail impacts are assumed to be minimal except for the unknown impacts of Alternative 5 – Albany Extension. Sixty-nine rail crossings are assumed to be impacted for all alternatives except for the Albany Extension which has 119 crossings due to the increased route mileage.

Paul Nelson (HNTB) presents the ridership estimation for the alternatives. Alternative 3 – Electrified Service and Alternative 4 – Full Local Service have the greatest effect on ridership. Alternative 6 – Northern Tier Rail Link has a built-in delay due to the transfer to MBTA Commuter Rail service. Alternative 5 – Albany Extension is in competition with other existing services in New York.

Operation and maintenance costs are higher for the electrified service; however, the ridership is the highest of the alternatives. Transportation cost savings accrue due to lower vehicle use and a decrease in parking fees paid in metro Boston. The economic impacts during construction assume Alternatives 2 through 6 are very similar and would transpire over four years while Alternative 1 assumes only three years of construction.

Economic impacts from construction include direct construction costs, indirect construction costs from vendors, and induced costs defined as the spending that occurs due to increased economic activity in the area.

The comparison to other services includes the Pere Marquette in Illinois/Indiana/Michigan, the Piedmont in North Carolina, the Downeaster in Massachusetts/New Hampshire/Maine and the Vermonter.

Paul Nelson (HNTB) explains that the key takeaways are that all alternatives can provide connectivity, mobility, and transportation choice, and are estimated to provide positive environmental and economic benefits. Alternative 3 – Electrified Service and Alternative 4 – Full Local Service generate higher ridership levels and the measurements associated with them, including transportation costs savings and VMT (vehicle miles traveled) reduction.

5. *Public Comment by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) opens the floor for questions and comments from the public as well as suggestions for next steps. She reviews the protocol for asking questions and/or sharing comments.

Representative Natalie Blais thanks the team for the comprehensive presentation that incorporated many of the questions and suggestions presented throughout the study process, and notes the excitement in Western Massachusetts for rail.

Senator Jo Comerford echoes Representative Blais' comments, inquires about outlining the next steps to study for the meeting participants and how to they can be most engaged, and asks how many people are in attendance or registered for the meeting.

Makaela Niles (MassDOT) notes that the meeting has 143 active attendees and explains that, based on the feedback received, the alternatives will be refined and recommended next steps for the study process will be developed.

Andy Hogeland requests additional information about long-term economic development.

Representative John Barrett echoes the comments made by Senator Jo Comerford and Representative Blais and expresses that the time has come to get am implementation program going.

Makaela Niles (MassDOT) reads a question from Clint Richmond who asks, what is superelevation?

Andreas Aeppli (Cambridge Systematics) explains that superelevation is elevating the outside rail to account for the impacts of higher speeds and improve passenger comfort through curved locations.

Anna M. Barry (HNTB) mentions that the rail service will pass through curved zones in central and western Massachusetts.

Rebecca Bialecki asked to clarify Athol's inclusion as a potential stop and states that it is one of the few communities that has seen population growth in the last two years, and would like that to continue. Rebecca mentions that new housing development coming and that the rail service would be important an asset to help continue the momentum.

Anna M. Barry (HNTB) comments that Athol has been included in at least a couple of the proposed alternatives.

Makaela Niles (MassDOT) expresses thanks for highlighting the connection between economic development, transportation, and housing, and reads a question from Mike Small, who asks about the population growth projected for Greenfield, if there will be a policy to encourage dense affordable housing to encourage walking and discourage sprawl or building in existing woodland and, failing the existence of policy for affordable housing, if there will be any plan to prevent spikes in rents.

Makaela Niles (MassDOT) expresses thanks for highlighting the connection between transportation and housing and adds that as any actions move forward, coordination with municipalities would be needed.

Andrew Fitch inquires about what else residents could do to support Northern Tier Passenger Rail.

Makaela Niles (MassDOT) notes that the public meeting attendance, together with the comments and questions received throughout the process has helped to shape the process. She expresses appreciation for the comments, questions, and participation throughout the process and mentions that continuing that momentum with comments, questions, participation, and reaching out to elected officials.

Sean Suhoski states that Athol is the hub of the North Quabbin region of the Commonwealth and points out that it is the second most populous stop between Gardner and Greenfield, with twelve thousand residents like North Adams. Sean mentions the access to the rail for economic development purposes whether for commuting or to increase job opportunities, and for access and quality of life, and expresses his excitement for the study.

Makaela Niles (MassDOT) reads two questions from Glenn Eaton regarding additional parking in Gardner, Athol, Greenfield, and North Adams: Have land acquisition costs for additional parking and/or costs relating to constructing additional parking lots or garages been included in the cost estimates, and have sites been identified in the study’s analysis or will those sites be identified by the time the final plan is complete?

Anna M. Barry (HNTB) states that the study generally identified potential locations for parking around most stations; however, parking lots or garages are not specifically included in the cost estimate. The study has focused on the station construction cost.

Janice Sorensen expresses interest in the local option and asks about what the cost of a ticket would be.

Anna M. Barry (HNTB) states that fare policy is usually developed further along in the development of a transportation service and was not the focus of this study at this stage of planning.

John Garrett echoes previous comments, expresses interest in Alternative 3 – Electrified Service and Alternative 4 – Full Local Service, and supports building the service quickly. He discusses the cost of electrification and the impact on meeting climate goals, and asks about the study's cost per mile, compared with various international and national rail projects.

Anna M. Barry (HNTB) states that the study's estimates were developed using the best information available by experts in this type of work who drew upon their experience, and notes that as the project is refined, prices can also be refined.

Paul Nelson (HNTB) adds that this question arises a lot with rail, and transit projects in general. He mentions a report that was completed on why it is cheaper to do transit in other countries and notes the standard of practice for these types of efforts. He notes differing standards for substation construction and other elements.

Makaela Niles (MassDOT) reads a question from Clint Richmond who asks if the catchment for a station is larger for intercity travel compared to commuter rail.

Andreas Aeppli (Cambridge Systematics) states that catchment areas could be considered larger for intercity service and that this was taken into consideration along the corridor. He mentions the relationship between how far away someone is from the service and the trip time to connect to the service, and the of the East-West rail project on passenger decision-making.

Anna M. Barry (HNTB) notes that in developing and modeling travel schedules, connections to North-South service was considered.

Pam Harty thanks the team for including a stop in Athol, advocates for electrification, and wants to ensure there is an understanding of what the costs are. Pam is also interested in understanding the impact on the environmental justice communities if diesel trains are used.

Anna M. Barry (HNTB) notes the benefits of electrification and adds that the other alternatives, even with diesel, show reductions in VMT. She mentions the study considers five trains per day and the impact of additional trips would be evaluated in a future phase of permitting.

Paul Nelson (HNTB) states the emissions from vehicles taken off the road are generally higher than the emissions released from the trains that would be running. He mentions the consideration of the impacts of idling or diesel emissions.

Andreas Aeppli (Cambridge Systematics) adds that there's variation in the types of emissions based on the rolling stock utilized.

Makaela Niles (MassDOT) reads questions from Susan Abrams, Ferd Wulkan, and Clint Richmond related to combining alternatives (e.g., the potential to combine Alternative 3 and Alternative 6), any impacts that combining alternatives may have on costs and the environment, and potential phasing.

Anna M. Barry (HNTB) explains that the team evaluated six alternatives for the purpose of showing the impacts and characteristics of the alternatives, and states that phasing is part of the next steps of implementation for policy makers and communities to weigh in on as the project progresses. She notes that Alternative 6 has the longest trip time and combining it with Alternative 3 would lose the benefit of the speeds.

Steven Ellis notes the benefits of the service to provide equitable access to economic, medical, and cultural resources in the eastern part of the state and mentions that, by building a service that attracts riders and is ecologically sound, the greatest economic and quality of life value from the project over time can be yielded. Steven expresses interest in more stops and mentions that the transfer in Fitchburg included in Alternative 6 could undermine the success of the system.

Makaela Niles (MassDOT) reads comments from Jim Mahon and Soren Henry supporting Alternative 4 – Full Local Service.

Lisa Blackmer requests that train schedules and fare cost be analyzed as economic drivers, for example as development of employment opportunities and tourism.

Anna M. Barry (HNTB) explains that modeled schedules were developed to serve a variety of needs, and that feedback from this meeting can be incorporated in the next steps.

Ferd Wulkan favors Alternative 3 – Electrified Service and asks if federal funding is available.

Anna M. Barry (HNTB) states that there are federal funds for intercity rail projects.

Andreas Aeppli (Cambridge Systematics) adds that federal legislation designates federal funding for intercity rail service and notes that each project is reviewed for economic efficacy.

Brianna Drohen states that she represents a nonprofit in North Quabbin area that works with young adults and mentions that transportation is a challenge for them. She expresses interest in the station in Athol and asks if the study included planned construction projects when looking at long-term economic development improvements for the area. She notes that local large housing projects and business incubators are being built.

Anna M. Barry (HNTB) states that population factored into the alternatives.

Paul Nelson (HNTB) states that benefit cost ratios will be looked at as part of the next phase of the study and that it includes a prescriptive way to measure things. He notes that one of the benefits considered is the increase in real estate value around stations.

Simon Kent expresses interest in Alternative 3 – Electrified Service and mentions that, in terms of economic savings, including other local stations is also great.

Makaela Niles (MassDOT) reads a question from Taylor Guss who asks if Alternative 3 – Electrified Service and Alternative 4 – Full Local Service have been considered together.

Makaela Niles (MassDOT) explains that elements could be added to the alternatives as they move forward.

Marcus Bean expressed concerns about reliability, the number of trips, and costs.

Anna M. Barry (HNTB) states that the projected schedules determined the infrastructure that would provide a reliable service and mentions operations and maintenance.

Tom Bernard advocates for the project to move forward for the economic, environmental, and equity benefits the rail service is expected to bring.

Makaela Niles (MassDOT) reads questions from Dawn Nelson**,** Elaine Sednek, and Emily Crowley regarding connecting to other transit services outside of the Northern Tier, how easily people will be able to move around Boston by public transportation from this service, ridership potential from UMass, and connections from the PVTA or FRTA to the Greenfield station.

Anna M. Barry (HNTB) explains the direct MBTA connections to the Red Line at Porter Square and to the Green Line, Orange Line, and commuter rail services at North Station. She mentions the need for support from communities and various stakeholders.

Paul Nelson (HNTB) shares that most of the station locations that were examined are at or near existing RTA hubs and services could potentially be coordinated to make connections.

Susan Abrams expresses excitement about the electrified option and expresses that the Northern Berkshires are particularly isolated and hard to reach for people who don’t have cars.

She mentions that maintaining a fast connection would make the service effective and asks about the impact of additional stops on speed and whether there is a possibility for a combination of some local service with some limited service.

Anna M. Barry (HNTB) shares that combining alternatives is possible. She notes the relationship between stopping patterns and ridership and that accessibility, mobility, and connectivity are important factors.

Andreas Aeppli (Cambridge Systematics) adds that, due to the limited service frequency of 5 trains, generally the practice is to try to put the same service out across all trains.

Makaela Niles (MassDOT) reads a comment from Ben Lamb who expressed excitement to see a realistic opportunity to bolster the economy of the entire Commonwealth through such a high impact project.

Makaela Niles (MassDOT) reads a comment from Senator Jo Comerford who agrees with Andy about the benefit of seeing longer term, community based economic projections for the Northern Tier communities, and says a climate impact analysis for the electrified service to help have a fuller picture of return on investment.

Chris Barkan offers appreciation for the presentation and asks why the ridership for electrification is estimated to be higher than higher investment.

Anna M. Barry (HNTB) explains that the reduction in trip time allowed for the addition of stations which generated additional ridership.

Paul Nelson (HNTB) adds that including Ayer as a station stop adds ridership to Alternative 3.

Makaela Niles (MassDOT) shares that the team will be able to respond to all remaining questions and comments after the meeting.

7. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) explains the next steps, which include making refinements and developing recommended next steps based on the feedback received, and thanks members of the public for attending and sharing their comments and questions. She encourages attendees to visit the Study website to submit additional comments or questions or sign up for Study updates. The materials from this meeting, including the video recording, will be made available on the Study website.

Northern Tier Passenger Rail Study Public Information Meeting #2 Attendees

MassDOT/Study Team:
- Makaela Niles – MassDOT
- Anna M. Barry – HNTB
- Paul Nelson – HNTB
- Sara Stoja – HNTB
- Rachel Gies - HNTB
- Andreas Aeppli – Cambridge Systematics
- Sofia Clark – City Point Partners
- Julie Callahan – City Point Partners

Public Attendees:

1. Alice Bojanowski
2. Allen Pope
3. Amy Proietti
4. Andrew Fitch
5. Andy Hogeland
6. Ann Hennessey
7. Anne Miller
8. Anthony Jewell
9. Anthony Manica
10. Barbara Alexander
11. Ben Heckscher
12. Ben Lamb
13. Benjamin Condit
14. Bob Seay
15. Brad Clements
16. Brad Harris
17. Brian Parkinson
18. Brianna Drohen
19. Bruce Spencer
20. C Mark Blatchley
21. Candace Hope
22. Cara Sturdevant
23. Carolyn Sellars
24. Carrie Greene
25. Casey Pease
26. Chris Barkan
27. Christine Copeland
28. Christopher Rodriguez
29. Claire McGinnis
30. Clete Kus
31. Clint Richmond
32. Connor Kowalski
33. Dale Waterman
34. Dan Peacock
35. Dana Roscoe
36. Daniel Racicot
37. David Greenberg
38. Dawn Nelson
39. Deborah Benoit
40. Debra Smith
41. Diane Parsons
42. Donna Bell
43. Donna Riggs
44. Drew David
45. Edward Hines
46. Elain He
47. Elaine Sednek
48. Elena Cohen
49. Eliana Tetreault
50. Elizabeth Giannini
51. Emily Bayard
52. Emily Crowley

53. Emily Villegas
54. Evan Fox
55. Ezekiel Baskin
56. Faith Williams
57. Ferd Wulkan
58. Fran Fortino
59. Frances Ludington
60. Franny Osman
61. Fred Heyes
62. Fungai T
63. Geve Mollins
64. Gillian Budine
65. Glenn Eaton
66. Grady VerPlanck
67. Greg Snedeker
68. Gregory Cox
69. Hannah Rechtschaffen
70. Isaak Baranoski
71. James Mussoni
72. Janice Rowan
73. Janice Sorensen
74. Jared Cowing
75. Jennifer Bernard
76. Jennifer Waryas
77. Jennifer West
78. Jenny Wright
79. Jeri Moran
80. Jim Mahon
81. Senator Jo Comerford
82. Joe Kurland
83. Johan Sednek
84. John Anhalt
85. Representative John Barrett
86. John Garrett
87. John Hostage
88. John Waite
89. Jonathan Franklin
90. K only
91. Kali Puppolo
92. Kate Richardson
93. Katherine Montgomery
94. Kathleen Lewis
95. Kathryn Soule-Regine
96. Kevin Bowe
97. Kristen Elechko
98. Kristin Cole
99. Larry Kuttner
100. Larry Mitchell
101. Liam Carey
102. Linda Dunlavy
103. Lisa Blackmer
104. Lisa Danek Burke
105. Marcel LaFlamme
106. Marcus Bean
107. Marie King
108. Marie-Elena Bigelow
109. Marjorie Kaye
110. Mary Ann Sacco
111. Matthew VanHeynigen
112. Melinda LeLacheur
113. Meryl Mandell
114. Michael Wagner
115. Mikael Pyrtel
116. Mike Small
117. Milo Chang
118. Molly Rapp
119. Morgan Everett
120. Nancy Klaips
121. Nancy Slator
122. Representative Natalie Blais
123. Nikki Garrett
124. Pam Harty
125. Pam Roberts
126. Patricia Murray
127. Paul Lipke
128. Paula Consolini
129. Raquel Jardim
130. Rebecca Bialecki
131. Rebecca Merrell
132. Remy Housley
133. Reona Kubomiya
134. Richard Colton

135. Richard Solomon
136. Robert Heller
137. Robert Slysz
138. Ross Jacobs
139. Roxann Wedegartner
140. Ruby Siegel
141. Scott Bastarache
142. Sharon Tracy
143. Shaun Schofield
144. Shaun Suhoski
145. Simon Kent
146. Soren Henry
147. Steven Ellis
148. Susan Abrams
149. Susan Cloutier
150. Taylor Guss
151. Thomas Green
152. Thomas Matuszko
153. Tim Pyper
154. Tom Bernard
155. Trevor Brightman
156. Wil Neeley
157. Yaroslava Yashchuk
158. Zeffa Kinney
159. Zoom user

Appendix A – Additional Public Comments Received

Question	Asker Name	Answer
What is the minimum and maximum projected time for rail service to become available under any of the alternatives? (Is it a matter of months, years, decades...)	Kate Richardson	As various steps are necessary prior to any implementation, a sample implementation timeline may be presented at upcoming meetings.
Can Paul speak in more detail about the VMT Reduction analysis - does it just analyze the Route 2 corridor VMT reduction, or does it also include MassPike VMT reduction benefits? I live in Williamstown and currentlly drive to Boston at least monthly. Many of those trips are driving Route 7 south to the MassPike East rather than on Route 2. I think that is quite common among people in the northern Berkshire area of North Adams/Williamstown/Pittsfield community. And this train service would be a game changer for those Pike travelers.	Thomas Green	The VMT reduction calculations assume that trips shifting to rail currently use Route 2.
As much as I would like to see all lines electrified, I don't see it as realistic for this project. See the example of South Coast Rail. Alternative 4 (local service) seems the most realistic. Forcing people to change trains in Fitchburg is a non-starter. Extending to Albany shows little benefit for the cost.	John Hostage	Thank you for your comments, John.
David Greenberg, Colrain: Thanks for reaching out to us. I strongly believe that we shoud be electrifying everything as our climate plan requires, so I support the electric train option.	David Greenberg	Thank you for your comments, David.
as a frequent Rt 2 traveler,i noticed praticulat particularly heavier traffic between Fitchburg and Gardner. The local option would best alleviate this situation and remove alot of traffic problems on Rt2 I believe.	James Mussoni	Thank you for your comments, James.
Thank you for representing the North Quabbin Rebecca!!!	Brianna Drohen	Thank you for your comments, Brianna.

Q. Why do the capital cost estimates assumed that MassDOT would need to purchase new rolling stock for this service? MassDOT has other intercity rail service in region, as example the Valley Flyer. The Valley Flyer was started without the need to purchase new equipment.	Ben Heckscher	The Valley Flyer was implemented by extending the route covered by existing intercity equipment, whereas there is currently no operating intercity equipment in the Northern Tier corridor.
What is the estimated cost per ride for example from Greenfield to Boston and N. Adams to Boston, one-way and round tirp?	Fran Fortino	Thank you for the question, Fran. Fare policy is typically developed further along in the development of a transportation service and was not the focus of this study at this stage of conceptual planning.
When projecting ridership did you consider how much a draw MassMOCA would be?	Mike Small	The projected ridership incorporates information from trips recorded by location-based service (LBS) vendors to MassMOCA and other major destinations in the corridor.
Thank you for your very thorough work! Your “eye charts” are very helpful! I’m very supportive of the return of some form of rail service to northern Berkshire County and support the local stops option. Would the plan be to build the service from West to East or East to West?	Paula Consolini	The Northern Tier Passenger Rail Study is a conceptual planning study assessing rail service alternatives along the North Adams-Greenfield-Boston corridor.
I’ll do a better job of helping to promote these events, then. Thanks, Makaela.	Andrew Fitch	Thank you for your participation and engagement, Andrew.
My biggest concern is for increased connectivity to NS rail in Greenfield	C Mark Blatchley	Thank you for your comment, C Mark. Improving connectivity and increasing mobility are key objectives of the study.
Susan Cloutier New Salem Select board I hope any parking and station development include solar electric generation facilities and recharge stations.	Susan Cloutier	Thank you for your comments, Susan.
I understand this is early in the process, but has the benefit of and for the proximal higher education institutions been included in further analysis plans? For instance I would anticipate easier access to MCLA in North Adams as a potential booster for enrollment and participation in programs.	Ben Lamb	Improving connectivity and access to destinations is one of the objectives of the study. The proposed alternatives aim to provide combinations of various elements to test how these characteristics relate to each

		other, while meeting the goals and objectives of the study.
I love hearing all the good work you all have done to reflect our wishes. My request: In future presentations, please also provide projections for the avoidance of fossil fuel use in the event that the electrified option is adopted.	K only	Thank you for your comments, K. Benefits such as avoided emissions will be included as part of the benefit-cost analysis.
Another reuest is whether you can address phasing of the project, so aspects of train service can begin relatively sooner, without waiting for everything to be built. We'd like to see how service can commence as soon as reasonably feasible.	Andy Hogeland	Thank you, Andy. The potential for phasing may be further examined as part of this or any future planning activities.
I would second Andy Hogeland's suggestion about trying to model the broader, longer-term economic development effects of this--especially as an aid to the process of decongestion of the Boston metro area. Daily commuters might come in from Athol. People working remotely but coming in to a Boston office once or twice a week might be able to move to the Greenfield area, or even to lovely North Adams.	Jim Mahon	Thank you for your comments, Jim.
I have a lot of concern with drainage under the track as many of the culverts date from earliest efforts to put a rail line here in the 1800's.	C Mark Blatchley	Stormwater run-off and the adequacy of drainage infrastructure may be evaluated as part of any future planning activities.
For the next public meeting, would it be possible to include a more in-depth climate analysis -- focusing on the carbon-reduction benefits of all electric service (not only the vehicle reduction, but the electric service itself)?	Elena Cohen	Environmental benefits may be discussed further at the next round of meetings.

If we go with an alternative that increases local stops in central and particularly eastern Mass, it will increase travel time for people in western Mass. I'm concerned that could decrease ridership in the west.	Emily Bayard	Thank you for your comment, Emily. The proposed alternatives aim to provide combinations of these elements to test how these characteristics relate to each other, while meeting the goals and objectives of the study.
Thank you so much for those comments about electrification being so high! How will we reach our climate change goals if we don't start electrifying.	Christine Copeland	Minimizing the impacts of public health and the environment from transportation is one of the goals of the Northern Tier Passenger Rail Study. The proposed alternatives aim to provide combinations of various elements to test how these characteristics relate to each other, while meeting the goals and objectives of the study.
The answer to why it is more expensive is prevailing wage.	Rebecca Merrell	Thank you for your comments, Rebecca.
Thank you, Makaela, Anna, Paul, and Andreas for all your work on this! This is Ezekiel Baskin from the New England Rural Health Association. I just wanted to echo many others in their support for this - especially for alternatives 3 & 4. I would love to see an electrified alternative with full local service. Transportation is a key social determinant of health, especially in rural communities like those in the North Quabbin that have long histories of underinvestment from the state, and having access to rail would have a significant positive impact on health outcomes as well as economic development.	Ezekiel Baskin	Thank you for your comments, Ezekiel.
I assume it was mentioned before I arrived, and will hear that on the recording, but if not, can you comment on the relationship between this connection and the North South Rail Link? AND other question is what best way for residents to advocate for this rail connection.	Franny Osman	The Northern Tier passenger rail service alternatives in this study terminate at Boston's North Station. Related to advocacy, please connect with your elected officials regarding this effort.

I would also like to express my support for the electrification option. The environmental benefits, over team, might even become a factor to attract even more ridership from folks who want to live conscientiously. More analysis on long-term environmental impacts of electrification vs. diesel would not only be great for educating the public on the options, but also for galvanizing support among more groups, particularly as gen-z enters the workforce.	Kate Richardson	Thank you for your comments, Kate.
Let's not undermine the speed of the trip across the state by adding too many local stops	Susan Abrams	Thank you for your comments, Susan.
I am very intereted in understanding outgoing traffic to towns as destiination centers for increased tourist $	C Mark Blatchley	Estimated induced benefits from the project have been calculated in relation to the construction spending. Additional types of induced benefits may be further studied as part of this or other efforts.
Does the economic development impact consider commercial in additional to residential real estate?	Brianna Drohen	The benefit-cost analysis incorporates an estimated increase in real estate values (including both commercial and residential uses) within a certain proximity to the proposed train stations.
Is Amtrak the only rail service that is currently being considered to use the rail, or is there a possibility that MassDOT would have its own passenger rail service, similar to CTrail on the Hartford Line?	Kate Richardson	Thank you for the question, Kate. The study assumed Amtrak may operate the proposed service. Please note that Amtrak is the only railroad that has rights of access to the facilities of any other railroad or regional transportation authority.
I'm excited by this project, any option is better than what we currently have! I'd like to be another voice of support for electrification, might as well do it now rather than redo it in a few years. Also happy to see more stations on the list. I think the worst option would be to stop in	Drew David	Thank you for your comments, Drew.

Fitchburg instead of going all the way to Boston.		
FTA runs a bus to Northampton students could take. But not on weekends.	Mike Small	Thank you for this insight, Mike.
Thank you for providing this opportunity tonight. As someone who commutes to Boston from a hilltown west of Shelburne Falls, having this service would be invaluable. As a rider the number one priority is the reducing ride time. The lower cost alternative(s) would not provide a ride time that would make it worth it to use a commuting alternative. One note, the towns west of Shelburne Falls will likely NOT go to North Adams to ride to Boston (as shown in slide), we would get on in Greeenfield. Thank You.	Lisa Danek Burke	Thank you for your comments, Lisa.
Thank you SO much!	Dawn Nelson	Thank you for your participation and engagement, Dawn.
Excellent presentation—thank you so much~	Susan Abrams	Thank you for your participation and engagement, Susan.
Thank you!	Kathryn Soule-Regine	Thank you for your participation and engagement, Kathryn.

Northern Tier Passenger Rail Study Working Group Meeting #4
Thursday, March 21, 2024, 1:00 PM
Held Virtually Via Zoom

Meeting Summary

The Northern Tier Passenger Rail Study Working Group met for the fourth and final time on March 21, 2024. At this meeting, the Study team shared an overview of the study's background, reviewed the study alternatives, outlined issues and opportunities to consider, presented draft recommended next steps and draft implementation plan, and garnered feedback. The meeting was also open to members of the public, who were given the opportunity to share comments and questions at the end of the meeting.

Meeting Notes

1. *Welcome, Ground Rules, and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the fourth and final Working Group meeting and are informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself, thanks all participants, and explains the meeting notes and procedures including how to participate. She then introduces the agenda for the Working Group meeting, which includes an overview of the study, review of alternatives, presentation of issues and opportunities for consideration, draft recommended next steps and draft implementation plan, Working Group discussion, public comment, and finally next steps.

2. *Study Overview by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) explains the Study overview and process, which includes the following:
- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory, and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

The Study team presents the goals and objectives for the Study, which are to:
- Support economic development along the Northern Tier corridor
- Promote transportation equity
- Minimize the impacts on public health and the environment from transportation

3. *Study Alternatives Review by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) reviews the two-phase alternatives development process. Phase 1 developed a "Lower Investment Alternative" and a "Higher Investment Alternative," which were presented at the public workshop to obtain feedback. Phase 2 used that feedback to develop four additional alternatives for providing service along the corridor.

Anna M. Barry (HNTB) opens with the Phase 1 alternatives. Alternative 1, *Lower Investment*, features five round-trip trains per day stopping at four stations (North Adams, Greenfield, Fitchburg, and North Station) and improvements to portions of the tracks and associated infrastructure. Alternative 2, *Higher Investment*, also features five trains per day and the same four stations, with a higher level of infrastructure improvements that would allow faster train speeds.

She then introduces the Phase 2 alternatives, which were developed based upon stakeholder feedback from Phase 1. All the Phase 2 alternatives build on Alternative 2, *Higher Investment*, and the faster service allowed by those track improvements. Alternative 3, *Electrified Service*, would feature electrified services via overhead catenary wire and stops at seven stations (North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter, and North Station). Alternative 4, *Full Local Service*, would feature stops at eight stations (North Adams, Shelburne Falls, Greenfield, Athol, Gardner, Fitchburg, Porter, and North Station). Alternative 5, *Albany Extension*, would extend service to Albany, NY, serving seven stations (Albany and Schenectady in New York, North Adams, Greenfield, Fitchburg, Porter, and North Station). Alternative 6, *Northern Tier Rail Link*, would provide service to North Adams, Greenfield, Athol, and Fitchburg, and require passengers to transfer to the MBTA Commuter Rail's Fitchburg Line for service to North Station.

Paul Nelson (HNTB) presents the evaluation criteria used to compare the six alternatives: service frequency, number of stations served, eastbound travel times and how they compare to driving, maximum train speeds, environmental impacts, passenger rail impacts, freight rail impacts, community/safety impacts (e.g., grade crossings), estimated annual ridership, capital cost per mile and capital cost per rider, operating and maintenance cost per rider, transportation cost savings for riding versus driving, annual reduction in vehicle miles travelled (VMT), and economic impacts from construction of the new service (e.g., track improvements, new stations, etc.). He explains the factors that affect each item (e.g., stopping patterns and estimated ridership) and how the total estimated cost for each alternative was determined. He reviews the total costs for the alternatives and explains the total capital cost and the total annual operations and maintenance costs. He then discusses the benefit-cost analysis (BCA). He states that the key takeaways are that all alternatives are estimated to provide connectivity, mobility, and choice, and are estimated to provide positive environmental and economic impacts. He notes that Alternatives 3 and 4 generate the highest ridership levels and the measurements associated with them, including transportation cost savings and VMT reduction.

4. *Issues and Opportunities by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) states that the governance (who will oversee existing or new intercity passenger rail service within the Commonwealth) was examined by the Western Massachusetts Passenger Rail Commission, which recommends that current and new intercity passenger rail services should be developed and operated by MassDOT.

She discusses Compass Rail, a regional rail network initiative for east-west and north-south rail services in Massachusetts. She notes that this is intercity rail (not commuter rail) and is administered by MassDOT's Rail and Transit Division, which partners with Amtrak, CSX, and abutting states.

Anna M. Barry (HNTB) discusses access considerations and notes that the host railroads and the passenger rail operator would need to consent for service to occur and to obtain federal funds. She also discusses the existing infrastructure, stating that there are many unknowns regarding how repairs or improvements to bridges, tunnels, etc., might affect the cost. Cost estimates include contingencies, but costs could still increase due to unknowns.

Paul Nelson (HNTB) discusses the current population projections and how population trends affect ridership projections. He states that population at the western end of the corridor is projected to decline while population at the central portion of the corridor is expected to increase modestly. He notes that pandemic-related changes in population and travel patterns could be further evaluated.

He discusses the intersection of housing and transportation, and what supporting infrastructure may be needed - such as impacts on schools, local businesses, and tourism opportunities. He then presents potential funding opportunities, including federal funding programs, state funding programs, and local funding and financing programs.

5. *Draft Recommended Next Steps, by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) presents the draft recommended next steps for the Study, which are to:

- Continue to improve understanding of travel demand along the Northern Tier corridor, corridor segments, and linkages to key regional destinations;
- Continue to advance planning efforts at the intersection of economic development needs and opportunities, including at potential station locations;
- Explore scheduled motor coach service to Northern Tier corridor destinations;
- Evaluate alternative phasing or implementation strategies;
- Evaluate express service between Fitchburg and Boston;
- Monitor freight use and trends in the corridor to explore needs/opportunities for public investment; and
- Develop strategies for improving rail connections within the corridor to meet study goals of supporting economic development, transportation equity, and minimizing impacts to public health and the environment.

6. *Draft Implementation Plan by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) introduces the draft implementation plan and the six-step project development process of the Federal Railroad Administration (FRA) from planning through operation. She mentions that the Northern Tier Passenger Rail Study falls under the earliest stage of this implementation process (systems planning) and presents a sample implementation timeline.

7. *Working Group Discussion by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) asks for questions and comments from the Working Group. She reviews the protocol for asking questions and/or leaving comments.

Jackson Moore-Otto asks about Class 4 versus Class 5 track (i.e., speed categories) and why Class 4 seems to be the maximum considered for this project.

Anna M. Barry (HNTB) responds that the study looked at reasonable increases in speed based on track conditions at this stage.

Kevin Lynch notes that Norfolk Southern is a part owner of Pan Am Southern and is one of the host railroads along the corridor.

Dan Rivera asks about the federal grants presented and what the monetary gap would be anticipated to be between the grant money likely to be awarded and the actual construction cost; and then asked how the federal grants will inform the project cost and decisions.

Anna M. Barry (HNTB) responds that some efforts are yet to be undertaken before the project could consider applying for grants and that what grants are available will depend on the project timing as federal grants change over time.

Representative John Barrett expresses concern about the study’s timeline and states that the process keeps adding items rather than reaching a final report that can advance to the next steps. He wants to see action and receive answers. He mentions the economy in the area he represents and expresses that rail, along with broadband, are ways to boost it.

Makaela Niles (MassDOT) thanks Representative Barrett for sharing these comments and concerns and notes that the draft recommendations presented aim to advance this effort.

Senator Jo Comerford thanks the team for their work. She then asks about the exploration of funding and investing in this effort moving forward.

Makaela Niles (MassDOT) responds that the funding sources shared in the presentation will be documented in the draft final report.

Senator Comerford then asks a follow-up question: Is MassDOT going to push forward in exploring those funding potentials?

Makaela Niles (MassDOT) responds that funding strategies will be explored as specific portions of the project are identified and realized.

Jackson Moore-Otto asks: Will actual cost assumptions be made public? To what extent has the project team been in conversation with the Rail Transformation Office of the MBTA? Will improvements be made to the Fitchburg to North Station segment of the line? Might the Fitchburg Line be electrified, and travel time speeded up?

Makaela Niles (MassDOT) mentions that the cost analysis will be included in the appendices to the final project study report, which will be available to the public.

Anna M. Barry (HNTB) states that no improvements to the MBTA Fitchburg Line were considered for this study; however, it is assumed that by the time this project is underway, electrification of the Fitchburg Line will already have been completed. She mentions that there would need to be coordination with the MBTA.

Representative Natalie Blais states that it is her understanding that the study has been funded, but there is no more funding to do any more work on a study.

Makaela Niles (MassDOT) notes that this study is looking at conceptual planning for the corridor and confirms that there is no additional funding for study at this time.

Representative Blais asks how a decision would be made as to what the best plan is to move forward and what that process looks like.

Makaela Niles (MassDOT) states that, based on the feedback received and the analysis, Alternatives 3 and 4 (electrified service and full local service) might be the options that are advanced for further development.

Anna M. Barry (HNTB) confirms that Alternatives 3 and 4 had the best measurements and metrics related to benefits and cost effectiveness. She mentions the project development, environmental, and governance processes, and notes that the alternatives would need to be reviewed in greater detail in preparation for any potential funding opportunities.

Representative Blais asks if the preferred alternative is something that the Commonwealth would need to address in order to determine whether or not to apply for available federal funds.

Anna M. Barry (HNTB) mentions that some federal funding programs can support planning and that largely it is the Commonwealth’s responsibility to determine the direction to take.

Representative Blais mentions governance and asks to clarify that MassDOT is the agency that would take on determining what the next steps are.

Anna M. Barry (HNTB) states that MassDOT has the responsibility to administer the programs and executes the policy decisions of the legislature and the governor.

Representative Blais notes that the recent governance study said that MassDOT should be the one to oversee rail development in Western Massachusetts and asks for clarification on how decisions will be made.

Anna M. Barry (HNTB) mentions that state and federal planning processes require documented community input, as well as measurements and metrics that show benefits and costs, to demonstrate that there is a consensus behind the choice made.

Representative Blais mentions that MassDOT would be the organization to oversee the analysis and determine what the next best step forward is before applying for federal funds and notes the benefit-cost analysis. She also asks about the benefit-cost for West-East Rail.

Anna M. Barry (HNTB) states that different grant programs have different criteria and notes that some of the grant programs for discrete types of improvements might be able to be funded.

Representative Blais states that there is a great deal of excitement for this project and for the economic development it could bring and encourages MassDOT to move forward quickly.

Representative Barrett comments that the funding issues have been brought up in previous Working Group meetings and emphasizes that the study is entering its third year and expresses frustration that things have to start to happen.

Makaela Niles (MassDOT) thanks him for his comments and states that the team looked at funding at the federal, state, and local levels that, in combination, could address either in part or all of the development of the process. She notes that some of the funding sources address planning, others address construction, and some address both planning and construction.

Representative Barrett points to funding available for passenger train service in Western MA and states that some of it should begin to be used for this project.

8. *Public Comment by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) opens the floor to questions and comments from the general public.

Makaela Niles (MassDOT) reads a question from Andrew who asks, if the Albany extension were implemented, would New York State contribute to the construction costs?

Anna M. Barry (HNTB) responds that for intercity passenger rail projects, states would need to be engaged and agree to the service, as well as any associated costs.

Makaela Niles (MassDOT) reads a question from Frank who asks, has any consideration been given to adding a multi-use path along the rail line?

Anna M. Barry (HNTB) states that the focus of the effort was the implementation of passenger rail service, so the potential for multi-use paths were not addressed in the study but that does not preclude the possibility of it in the future. She notes that anything within the right-of-way has to be agreed upon by the owners as well as any partner states there may be.

Andy Hogeland thanks the team and asks about the economic benefits of the project and whether more detailed work, such as broadening the scope of topics, will be done as part of this or a future effort.

Paul Nelson (HNTB) states that the primary economic benefits examined were those due to construction and the travel benefits tied to having people travel on the rail service, and the use of benefit-cost analysis guidance. He mentions that other potential benefits could be looked at in more detail.

Price Armstrong (Cambridge Systematics) adds that the benefit-cost analysis is one of the key frameworks for pursuing federal funding and mentions qualitative and alternative lenses for looking at induced economic development.

Jacob Harrington (UMass Donahue Institute) adds that some benefits are uncertain and are difficult to quantify because of changes that can happen in the years after a service begins.

Carl Fowler states that the terminus of the service should be Williamstown due to its tourism destinations and academic institutions. He also states that connectivity from Vermont should be considered.

Makaela Niles (MassDOT) notes that the legislation for this study directed MassDOT to conduct a feasibility study of rail access between Boston to North Adams, and that is the background on why North Adams was considered to be the terminus for the majority of the alternatives.

Makaela Niles (MassDOT) reads a question from Andrew who asks, does the Albany extension ridership assumption factor in visitors who might come to the Berkshires from Albany and New York City?

Paul Nelson (HNTB) states that the ridership numbers took multiple factors into account such as population and employment data, and trip data within the corridor around the station locations. He adds for Carl that Williamstown was incorporated within the catchment area that was examined and that a variant that includes a Williamstown station and its potential benefits could be looked at. He states that while trips in New York within proximity to the borders of Massachusetts were incorporated, New York City ridership was not captured.

Joe Kurland states that he is eager for this project to be implemented and that the full local service (Alternative 4) including Williamstown is important.

Makaela Niles (MassDOT) reads a question from Paula who asks, what will it take for the Northern Tier to be added to the Compass Rail schematic?

Makaela Niles (MassDOT) states that Compass Rail is an evolving effort and as the Northern Tier progresses it may be added to the process.

Makaela Niles (MassDOT) reads a question from Jim who asks, what would the ridership have to be to get the benefit-cost ratio to 1?

Paul Nelson (HNTB) states that ridership would have to be significantly higher. He adds that there are opportunities to grow awareness and interest in train travel within the corridor and that varying the frequency, coverage area, associated costs, and other elements could be a place to start to achieve a higher benefit-cost ratio.

Makaela Niles (MassDOT) reads a question from Dave who asks, why contract with Amtrak when the state has a dedicated Commuter Rail workforce?

Anna M. Barry (HNTB) mentions the two different types of passenger rail services (intercity and commuter rail) and explains that commuter rail involves high frequency, peak-oriented service and intercity service has fewer stops, greater distances between stops, and less frequency compared to commuter rail service. She notes that Amtrak is the intercity rail operator in the U.S. and their right of access to rights-of-way.

Makaela Niles (MassDOT) reads a question from Ben who asks how the business community has been engaged, and mentions that between workforce, tourism, and hybrid work, it seems business opportunities go beyond what a pure number analysis can represent.

Anna M. Barry (HNTB) states that the impacts on businesses were examined and notes the participation through the study’s Working Group.

Paul Nelson (HNTB) adds that the potential impact of relocation and hybrid work are factors that would be recommended to be examined.

Makaela Niles (MassDOT) thanks everyone for sharing their comments, questions, and concerns.

9. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) informs the meeting attendees of the public meeting being held next week and invites everyone to register and attend. She states that following that meeting, a draft final report will be released and made available for public comment, then finalized in a final report. She thanks attendees for their participation and encourages visiting the study website to sign up for study updates and to share additional feedback, comments, and questions. She mentions that the materials from this meeting will be made available on the Study website. Makaela Niles (MassDOT) wishes everyone a good rest of their day and concludes the meeting.

Northern Tier Passenger Rail Study Working Group Meeting #4 Attendees

MassDOT/Study Team:

- Makaela Niles - MassDOT
- Anna M. Barry - HNTB
- Paul Nelson - HNTB
- Price Armstrong - Cambridge Systematics
- Jacob Harrington - UMass Donahue Institute
- Sofia Clark – HDR | City Point Partners

Working Group Members & Alternates:

1. Elizabeth Quigley – Office of Congressman Richard Neal
2. Jo Comerford - State Senator
3. John Barrett - State Representative
4. Natalie Blais - State Representative
5. Linda Dunlavy - Franklin Regional Council of Governments
6. Robert Malnati - Berkshire Regional Transit Authority
7. Thomas Matuszko - Berkshire Regional Planning Commission
8. Bruno Fisher – Montachusett Regional Transit Authority
9. Marco Turra – CSX Transportation
10. Kevin Lynch - Norfolk Southern Railway
11. Jackson Moore-Otto - TransitMatters
12. Dan Rivera - MassDevelopment
13. Roy Nascimento - North Central Massachusetts Chamber of Commerce

Public Attendees:

1. Andreas Aeppli
2. Alexander Bergstrand
3. Gus Bickford
4. Amy Cahillane
5. Frank Citino
6. Elena Cohen
7. Paula Consolini
8. Paige Dolinski
9. Michael Fesen
10. Andrew Fitch
11. Carl Fowler
12. Jacquelyn Goddard
13. Tyler Godin
14. Thomas Green
15. Ryan Griffis
16. Ben Heckscher

17. Andy Hogeland
18. George Kahale
19. Joe Kurland
20. Benjamin Lamb
21. Jerry Lund
22. Jim Mahon
23. Linda Maloney
24. Grego Mori
25. Mary Ann Nessel
26. Dawn Nims
27. Walker Powell
28. Kali Puppolo
29. Leo Quigley
30. Sidney Rothstein
31. Richard Rudolph
32. Eric Smith
33. Patrick Snyder
34. Dave Stevenson
35. Susan Templeton
36. Jenny Wright

Northern Tier Passenger Rail Study Public Information Meeting #3

Thursday, March 28, 2024, 6:00 PM
Held Virtually Via Zoom

Meeting Summary

The Northern Tier Passenger Rail Study team held a third and final Public Information Meeting on March 28, 2024. At this meeting, the Study team shared an overview of the study's background, reviewed the study alternatives, outlined issues and opportunities to consider, presented draft recommended next steps and draft implementation plan. Members of the public were given the opportunity to share comments and questions at the end of the meeting.

Meeting Notes

1. *Welcome, Ground Rules, and Agenda by Makaela Niles, MassDOT (Project Manager)*

All attendees are welcomed to the third and final virtual public meeting of the Northern Tier Passenger Rail Study and are informed that the meeting is being recorded. Makaela Niles (MassDOT) introduces herself and explains the ground rules for the meeting including how the public can participate. She then introduces the agenda for the meeting, which includes an overview of the study, review of alternatives, presentation of issues and opportunities for consideration, draft recommended next steps and draft implementation plan, public comment, and finally next steps.

2. *Study Overview by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) explains the Study overview and process, which includes the following:

- Public participation
- Documenting past efforts
- Market analysis
- Physical, regulatory, and right-of-way (ROW) ownership
- Potential service plans and alternatives
- Alternatives evaluation and cost estimate
- Development of recommended next steps

The Study team presents the goals and objectives for the Study, which are to:

- Support economic development along the Northern Tier corridor
- Promote transportation equity

- Minimize the impacts on public health and the environment from transportation

3. *Study Alternatives Review by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) reviews the two-phase alternatives development process. Phase 1 developed a "Lower Investment Alternative" and a "Higher Investment Alternative," which were presented at the public workshop to obtain feedback. Phase 2 used that feedback to develop four additional alternatives for providing service along the corridor.

Anna M. Barry (HNTB) opens with the Phase 1 alternatives. Alternative 1, *Lower Investment*, features five round-trip trains per day stopping at four stations (North Adams, Greenfield, Fitchburg, and North Station) and improvements to portions of the tracks and associated infrastructure. Alternative 2, *Higher Investment*, also features five trains per day and the same four stations, with a higher level of infrastructure improvements that would allow faster train speeds.

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4. *Issues and Opportunities by Anna M. Barry and Paul Nelson, HNTB*

Anna M. Barry (HNTB) states that the governance (who will oversee existing or new intercity passenger rail service within the Commonwealth) was examined by the Western Massachusetts Passenger Rail Commission, which recommends that current and new intercity passenger rail services should be developed and operated by MassDOT.

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He discusses the intersection of housing and transportation, and what supporting infrastructure may be needed - such as impacts on schools, local businesses, and tourism opportunities. He then presents potential funding opportunities, including federal funding programs, state funding programs, and local funding and financing programs.

5. *Draft Recommended Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) presents the draft recommended next steps for the Study, which are to:

- Continue to improve understanding of travel demand along the Northern Tier corridor, corridor segments, and linkages to key regional destinations;
- Continue to advance planning efforts at the intersection of economic development needs and opportunities, including at potential station locations;
- Explore scheduled motor coach service to Northern Tier corridor destinations;
- Evaluate alternative phasing or implementation strategies;
- Evaluate express service between Fitchburg and Boston;
- Monitor freight use and trends in the corridor to explore needs/opportunities for public investment; and
- Develop strategies for improving rail connections within the corridor to meet study goals of supporting economic development, transportation equity, and minimizing impacts to public health and the environment.

6. *Draft Implementation Plan by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) introduces the draft implementation plan and the six-step project development process of the Federal Railroad Administration (FRA) from planning through operation. She mentions that the Northern Tier Passenger Rail Study falls under the earliest stage of this implementation process (systems planning) and presents a sample implementation timeline.

7. *Public Comment by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) opens the floor to questions and comments from elected officials and members of their staff in attendance.

Andrew Fitch, North Adams City Councilor, asks why trains would be limited to 80 mph, how people in North Adams can be most effective in advocating for train service, and expresses support for the Albany Extension option because of the tourism and academic institution draws and the potential to improve traffic from New York City.

Anna M. Barry (HNTB) states that the 80-mph speed limit is due to the class of track and the associated speed limit.

Paul Nelson (HNTB) describes the ridership estimation process and the data used to assess trips. He adds that train speeds are also limited due to the curved alignment of the Northern Tier corridor as well as the track class.

Anna M. Barry (HNTB) adds that stakeholder engagement is necessary to advance the process to develop projects and move from planning into projects.

Makaela Niles (MassDOT) reads a question from Ashley Shade, North Adams City Council Vice President, who asks about estimated ticket costs.

Anna M. Barry (HNTB) states that fare planning and policy would be developed further along in project planning and fares would depend partly on how the system would be overseen.

Makaela Niles (MassDOT) reads a question from Senator Jo Comerford who asks: how many people are participating tonight?

Makaela Niles (MassDOT) responds that there are currently 240 attendees.

Makaela Niles (MassDOT) reads a question from Senator Jo Comerford who asks: In terms of the recommended next steps, does MassDOT have the funding necessary to undertake this work?

Paul Nelson (HNTB) explains that some federal programs offer grants for additional planning and preliminary design activities and notes that the Federal Railroad Administration has grants for intercity passenger rail projects.

Makaela Niles (MassDOT) reads a question from Senator Jo Comerford who asks: What was the BCA for West-East rail service from Pittsfield to Boston?

Anna M. Barry (HNTB) responds that the design and construction costs were high, and estimated ridership was low. Paul Nelson (HNTB) (later in the meeting) states that the BCA was not above 1.

Virginia Desorgher, Mayor of Greenfield, says that Northern Tier Passenger Rail Service would be a game-changer and encourages the effort to move forward.

David Martin, Acton Select Board, asks about synergy or overlap with Commuter Rail electrification especially with Alternative 3. He asks about cost implications and, if not electrification, will it be diesel locomotives in areas where Commuter Rail has been electrified?

Anna M. Barry (HNTB) responds that the study assumes that MBTA would electrify Commuter Rail and did not include the electrification of Commuter Rail territory as part of the Northern Tier study or its costs. She mentions that any initial Northern Tier services could be diesel.

Senator Jo Comerford encourages stakeholder engagement to gain the game-changing aspects of this rail service, and states that the entire Northern Tier state delegation is united in support of moving forward at the fastest pace possible.

Makaela Niles (MassDOT) reads a question from Lora Wondolowski, Greenfield City Councilor, who asks who will take the lead in applying for the federal grants mentioned?

Paul Nelson (HNTB) states that federal grants are very specific in identifying who can apply for them and partnerships around rail service can also apply and be rewarded. He notes that a key to many of the grant applications is to get letters of support.

Makaela Niles (MassDOT) then opens the questions to members of the public in attendance.

Makaela Niles (MassDOT) reads a question from Joe, who asks if the reason the Albany Extension ridership estimate is so low is because it only counts people using that section?

Paul Nelson (HNTB) responds that there is competing service on the Albany-Boston route, plus the route is circuitous and therefore slower than other services.

Makaela Niles (MassDOT) reads a comment from Joe, who states that at last week's session someone advocated for service to Williamstown, and he agrees with that addition and would also like to see a station in Charlemont to serve the recreational businesses there.

Carl Sailor mentions having heard that passenger lines can attract ridership not necessarily from car trips, but from people who wouldn't have travelled otherwise and asks if there is anything in place, similar to an advertising campaign, to attract new ridership from car users.

Anna M. Barry (HNTB) responds that a marketing campaign would generally happen closer to the opening of a service in the year or so before it would begin.

Halley Kelly asks how theoretical fares are considered when estimating ridership.

Anna M. Barry (HNTB) states that fare prices were not considered in determining ridership at this point; the attractiveness of the service, travel time comparisons, and changes in population were considered. She mentions that generally fares and fare policy are set further along in the process.

Marcel LaFlamme mentions Compass Rail and wants to make sure that the needs of the Northern Tier are not subsumed under a Springfield service model.

Makaela Niles (MassDOT) reads a question from Tracy, who asks about parking fees not being factored into Albany estimated ridership.

Paul Nelson (HNTB) responds that parking fees in Albany were not considered as part of the transportation cost savings.

Makaela Niles (MassDOT) reads a question from Aimee, who asks whether grants or incentives for reducing CO_2 or particulates might apply to Alternative 3 and, if so, have those been factored into the cost estimates?

Anna M. Barry (HNTB) replies that revenue sources have not been incorporated into the cost estimates and notes that the cost estimates represent the cost of making the infrastructure improvements.

Makaela Niles (MassDOT) reads a question from Alice, who asks about whether improved electrification could be added later for Alternative 4?

Anna M. Barry (HNTB) responds that catenary could be added later and is feasible, and notes that service would have to be adjusted while the work is being done.

William Quale echoes Mayor Desorgher's comments that this service will be a game-changer for communities in Franklin County and asks about future demand and the potential for higher frequency in the future.

Anna M. Barry (HNTB) states that intercity passenger rail services such as this one generally have lesser frequency, which is why the study looked at five trains in each direction per day. She mentions that the impact and cost of additional trains could be further analyzed for future decision-making.

Makaela Niles (MassDOT) reads a question from Rauley, who asks, did the economic benefit estimations of Alternative 3 take the follow-on benefits of electrification of the MBTA Fitchburg Line into account?

Paul Nelson (HNTB) responds that both the benefits and the costs of the MBTA territory being electrified were not calculated.

Makaela Niles (MassDOT) reads a question from Halley, who asks, do the avoided emissions include healthcare costs from inhaling emissions or just environmental damages?

Price Armstrong (Cambridge Systematics) responds that the values that went into the BCA for the emissions benefits take health benefits into account as defined by and in conformance with the federal guidelines.

Arthur Millet asks about how people from smaller towns will get to and from the stations and if there is anything to solve the last mile issue.

Anna M. Barry (HNTB) responds that these types of infrastructure and services would need to be planned and implemented as part of any service in collaboration with cities and towns, as well as regional transit authorities.

Makaela Niles (MassDOT) adds that this response also answers a question from Hugh in the Q&A queue regarding plans to integrate train station service with RTA bus services.

Makaela Niles (MassDOT) reads a question from Richard who asks, will the Pan Am Southern track be considered an MBTA service where MBTA Communities Laws apply?

Anna M. Barry (HNTB) states that this is intercity passenger rail service and notes that both intercity and commuter rail are defined in federal law and are treated differently with different funding sources and different governance structures. She mentions that, as this would be a corridor for intercity passenger rail, it would not be subject to a statute that governs the MBTA Commuter Rail services.

James Mussoni asks about the local service option and if the Gardner station and tracks there would need to be upgraded, as Gardner was once part of the MBTA in the late 1900s.

Anna M. Barry (HNTB) responds that the tracks between Fitchburg and Gardner are part of the Pan Am Southern territory and that it was used with permission of the freight railroad back then. She recalls that the site of the former Gardner station may not be a good location for a station, as standards for passenger stations are now different from then.

Sidney Rothstein expresses support for the project and asks, as more study is done, what are the possibilities for expanding the analysis of economic development and including more robust measures of economic development and growth that might be spurred by the project. Sidney also states that there may be significant differences in post-pandemic patterns that would lead to different projections.

Paul Nelson (HNTB) responds that the benefit-cost analysis is a very rigid tool and notes that the benefits depend on who the riders are, how much they are saving in travel time, and the use of a different mode of travel. He mentions Devens, Fitchburg, and Worcester as some case studies as a start to assessing what the additional elements of economic development could be.

Makaela Niles (MassDOT) reads questions from Allen and Helen, who both ask whether combining Alternatives 3 and 4 (electrification and full local service) is a possibility.

Anna M. Barry (HNTB) states that that is a possibility, and that as part of the systems planning phase, the alternatives can be refined where new or merged alternatives could be developed based on stakeholder engagement.

David Kechley expresses support for the Albany extension and asks, how soon can the service get started?

Makaela Niles (MassDOT) refers to the discussion about the FRA service development process. Anna M. Barry (HNTB) adds that additional planning steps could be taken and, as funding and resources to perform the work are identified, discussions with railroad partners would begin. She notes that the host railroads and Amtrak would need to be on board with the service. She mentions that these partners would then work together on further modeling of the preferred alternatives and that the permitting process would begin as part of the project design process. She states the need for additional planning in order to refine the alternatives and to start to get into project identification.

Makaela Niles (MassDOT) reads a question from Carl, who recalls hearing that there would be an attempt to synchronize arrival in Greenfield with Amtrak's Vermonter service and asks if there is a possibility of an increase in the Valley Flyer service, especially northbound during the daytime hours.

Anna M. Barry (HNTB) responds that schedules were developed around different parts of the day, and actual schedules would be intended to coordinate service between different routes to allow people to use multiple services.

Makaela Niles (MassDOT) again thanks everyone for their participation, and states that the meeting time is being extended to allow for more questions.

Myra Ross states that as a blind person, she currently has limited travel options and is supportive of this project. She adds that service from Albany to Boston through Greenfield is not fast or useful because there is so little of it and mentions the long travel time from Amherst to Boston. She encourages continuing to push for Northern Tier service and continuing to enlist the support of communities along or near the corridor.

Makaela Niles (MassDOT) reads a question from Dale, who asks, how do the regional planning commissions intersect with this process now and going forward, in relation to parking and coordination with regional transport.

Anna M. Barry (HNTB) states that MassDOT has been coordinating with regional planning agencies throughout the life of the project and that would continue.

Jean and John McClellan ask if anything can be learned from Japan, Europe, and China about how to expedite the timeline of this idea.

Anna M. Barry (HNTB) states that there may be construction methods and other insights that could be learned and points out that the processes for taking into account the interest of stakeholders differs. She adds that Europe and Japan have great high-speed rail that could be learned from technically, but for planning a railroad and beginning to construct it, there are systems in place with particular governance and funding structures.

Makaela Niles (MassDOT) reads a question from John Garrett, Greenfield City Councilor, who expresses support for the project, and asks if there is a plan to electrify the Fitchburg Commuter Rail Line out to Wachusett.

Anna M. Barry (HNTB) states that the MBTA is both committed and obligated to decarbonize its system and that while the cost of MBTA electrification was not included within the Northern Tier costs, it was assumed that it would occur.

Pam Harty asks why the ridership estimates for the electrified option were double and wants to learn a bit more about why.

Paul Nelson (HNTB) clarifies that the estimated ridership is between 196,000 and 304,000. He explains the relationship between the number of stops and the estimated ridership, which is why Alternatives 3 and 4 show higher ridership, and that travel time is also a factor.

Roy Kimmel asks about if the effort would be federally funded or strictly a state funded project, and if this will occur simultaneously with the effort to improve train service from Boston to Pittsfield. Roy also asks about who would operate the Northern Tier service.

Anna M. Barry (HNTB) responds that it could be a combination of federal, state, and local funding. She mentions that the operator would be Amtrak because Amtrak runs nearly all intercity passenger rail service in the United States. She also notes that both the East-West and Northern Tier rail efforts are currently progressing at the same time but are at different stages.

Makaela Niles (MassDOT) asks Anna M. Barry (HNTB) to share more about Amtrak’s rights of access. Anna M. Barry (HNTB) states that Amtrak’s enabling act gave it the right to access any railroad right-of-way in the country at a certain price level and that freight railroads and the MBTA are obligated to allow Amtrak to operate intercity passenger rail service on their rights-of-way for a negotiated cost.

Carl Sailor states that the presentation mentioned that the service is planned for five round trips per day and that Amtrak’s Downeaster was referenced as an example, and asks what circumstances would cause service to be increased.

Anna M. Barry (HNTB) states that intercity rail services generally start with a smaller number of daily trips and that, while the Downeaster also began with a smaller number of trips, the five trains a day was based on a schedule to serve the types of trips that riders on the Northern Tier are likely to be taking. She mentions the stakeholder communities and funding as additional factors.

Makaela Niles (MassDOT) states that there are five minutes left in the meeting and mentions that this is not the only opportunity to submit comments and questions. She states that additional questions may be submitted via the comment form on the study website and that responses will be provided for the questions in the Q&A. She then transitions to next steps.

8. *Next Steps by Makaela Niles, MassDOT (Project Manager)*

Makaela Niles (MassDOT) thanks everyone for their input and states that the feedback will be used to develop recommended next steps. She states that the study process will be documented in a draft report which will be released for public review and comment and finalized in a final report. She adds that notifications will be sent out once the draft final report has been released and encourages attendees to sign up for updates if they have not done so already.

She encourages attendees to visit the website to continue the conversation, reiterates that all comments and questions will be available on the website with responses, and notes that materials from tonight’s meeting will be made available on the website as well. Makaela Niles (MassDOT) wishes everyone a good rest of their evening and concludes the meeting.

Northern Tier Passenger Rail Study Public Information Meeting #3 Attendees

MassDOT/Study Team:

- Makaela Niles - MassDOT
- Anna M. Barry - HNTB
- Paul Nelson - HNTB
- Sara Stoja - HNTB
- Price Armstrong - Cambridge Systematics
- Dan Tempesta - Cambridge Systematics
- Branner Stewart - UMass Donahue Institute
- Sofia Clark - HDR | City Point Partners
- Joe Sgroi - HDR | City Point Partners

Working Group Members & Alternates:

1. Jo Comerford - State Senator
2. John Barrett - State Representative
3. Ginny DeSorgher – City of Greenfield
4. Linda Dunlavy – Franklin Regional Council of Governments
5. Thomas Matuszko - Berkshire Regional Planning Commission

Public Attendees:

1. Francis Abuisi
2. Andrew Achenbach
3. Andreas Aeppli
4. John Anhalt
5. Deborah Arak
6. Jennifer Atlee
7. Robert Baker-White
8. Trenton Barnes
9. Keith Barnicle
10. Daniel Barowy
11. Zach Bauer
12. Karen Benko
13. Freda Bennett
14. Joe Bergeron
15. Tom Bernard
16. Mell Bissell
17. Brad Bissell
18. Julia Blyth
19. Alice Bojanowski
20. Christopher Bolton
21. Laura Botkin
22. Stephanie Boyd
23. Colin Bratton
24. ralph Brill
25. Karuna Burgess
26. Harold Burnett
27. Deborah Burns
28. Fanely Caba
29. Rauley Caine
30. Mary Carey
31. Beth Carlisle
32. Barbara Carr
33. Charles Chandler
34. claire chang
35. Laura Chapdelaine
36. Julia Chevan
37. Laura Christensen
38. Bill Christian
39. Joe Cleary
40. Susan Cloutier
41. Stuart Cohen
42. Shannon Collins
43. Ben Comeau
44. John Compton
45. Tracy Compton
46. Paula Consolini
47. Donna Consolini
48. Gildo Consolini
49. Matthew Cooperman
50. Christine Copeland
51. Jared Cowing
52. Gregory Cox
53. Melissa Cragg
54. Bette Craig
55. Anne Crider
56. Janet Curran
57. Maeve Curtin
58. Mike Curtin
59. Zoe Danger
60. Tammy Daniels
61. Drew David
62. Karen K Davis
63. j Deery
64. briee Della Rocca
65. CM Deucher
66. Ellie Deveaux
67. David Dewey
68. Armando DiCianno

69. Matthew DiGennaro
70. Jessica Dils
71. Dina Dommett
72. Pam Dorwin
73. Anne Doyle
74. Abigail Drury
75. Stephanie Duclos
76. Patricia Duffy
77. Colleen DuroShea
78. Martha DuroShea
79. Kenneth Dymond
80. Holly Edwards
81. Morgan Everett
82. Pete Farwell
83. Tim Faselt
84. Michelle Faselt
85. Lynne Feldman
86. Jill Fenner
87. Stephen Ferguson
88. Andrew Fitch
89. Kay Flatten
90. Antonia Foias
91. Lucia Foley
92. Leo Franceschi
93. Claudia Frigeri
94. Susan Galereave
95. Sarah Gardner
96. John Garrett
97. Lynda Geraci
98. Elizabeth Giannini
99. Jaye Glenn
100. Laurie Glover
101. david grace
102. Virginia Grant
103. Thomas Green
104. Dan Greenberg
105. David Greenberg
106. Carrie Greene
107. Janet Gross
108. Nancy Grossman
109. Susanne Hale
110. Katherine Hand
111. Martha Hanner
112. Elaine Hantman
113. Jacob Harrington
114. Helen Harrison
115. Liz Hartung
116. Pam Harty
117. Donna Haskins
118. Laurie Heatherington
119. Ben Heckscher
120. Geoffrey Hedden
121. Kate Heekin
122. Gretchen Heinle
123. Robert heller
124. Fred Heyes
125. Ziporah Hildebrandt
126. Edward Hines
127. Cecilia Hirsch
128. Jennifer Howard
129. Brij Howard-Sarin
130. roger hoyt
131. Wendy Hudson
132. rebecca hull
133. Tom Hutcheson
134. Brian Intraversato
135. John Ireland
136. Amy Johns
137. Oliver Jones
138. David Kechley
139. Halley Kelly
140. roy kimmel
141. Cathleen King
142. Susan Kohut
143. Jim Kolesar
144. Alison Kolesar
145. William Kolis
146. Surya Kotapati
147. Matti Kovler
148. Cathy Kristofferson
149. Joe Kurland
150. Kenneth Kuttner
151. Larry Kuttner
152. Dale LaBonte
153. Marcel LaFlamme
154. Benjamin Lamb
155. Chris Larabee
156. Leah Larkey
157. Pat Larson
158. Richard LaVigne Sr

159. Renee Lazaras
160. Joan Levy
161. Kerry Li
162. Paul Lipke
163. Zuri Mabrey-Wakefield
164. Molly Magavern
165. Jim Mahon
166. John Maloney
167. Sarah Manley
168. Gerald Marcanio
169. Christopher Marcisz
170. MaryDelia Marshall
171. Richard Martin
172. David Martin
173. Martha Marvin
174. Andrea Massar
175. Hilary Matheson
176. Jean and John McClellan
177. Teresa McHugh
178. philip mcknight
179. Kathleen McKnight
180. Peter Mehlin
181. Rosemarie Meissner
182. Arthur Millet
183. Susan Milliken-Rogers
184. Quincy Morgan
185. Ronan Murphy
186. James Mussoni
187. Diane Nassif
188. Dawn Nelson
189. Carolyn Ness
190. Dawn Nims
191. David Nixon
192. Adrienne Nunez
193. Anne O'Connor
194. Gregory Olchowski
195. Martin Omasta
196. Marilyn O'Neil
197. Patricia O'Neill
198. James Paleologopoulos
199. Barbara Palmer
200. Betul Pamuk
201. David Paquette
202. Christopher Parker
203. Dan Peacock
204. Barbara Pearson
205. Julia Pedroni
206. Peter Pedroni
207. John Pelletier
208. Tim Petersen
209. Sally Petersen
210. Mary Peterson
211. Joann Phelan
212. Judith Phillips
213. Fiona Picone
214. Shelley Pierce
215. Carson Poe
216. Allen Pope
217. Emily Power
218. Pam Predmore
219. Read Predmore
220. Max Prum
221. Kali Puppolo
222. Christa Pylant
223. Hugh Pyle
224. Tim Pyper
225. Mikael Pyrtel
226. William Quale
227. Leo Quigley
228. Jay Racela
229. daniel racicot
230. Danielle Ramdath
231. Aimee Reische
232. todd reynolds
233. Kate Richardson
234. Clint Richmond
235. Paul Richmond
236. Molly Rideout
237. John Ridgway
238. Donna Riggs
239. Sarah Robertson
240. Steven Rockwood
241. Dana Roscoe
242. Myra Ross
243. Sidney Rothstein
244. Joanna Rueter
245. Carl Sailor
246. Mario Sassi
247. Renee Schiek
248. laura schoenbaum

249. Shaun Schofield
250. Mawusi Sefogbe
251. Christine Seibert
252. Sara Seinberg
253. Carolyn Sellars
254. Ashley Shade
255. Christopher Silvia
256. Anne Skinner
257. Andrew Smith
258. Tom Smith
259. Elizabeth Smith
260. David Smythe
261. Amy Sosne
262. Ben Sosne
263. Dorothea Sotiros
264. Laini Sporbert
265. Donald Sprague
266. James Starkey
267. Lauren Stevens
268. Suzanne Stinson
269. Kennedy Strakose-Griffin
270. Lenore Styler
271. Mallory Sullivan
272. Linda Sweeney
273. Jennifer Swoap
274. Desiree Taylor
275. Jane Tekin
276. Audrey Thier
277. Sean Thomas
278. Laurie Thomsen
279. Peter Thomsen
280. Claire Ting
281. Eva Tracy-Raeder
282. carolyn umlauf
283. S. Vaithee Swaran
284. Debra Van Deusen
285. Robert Van Deusen
286. Matthew VanHeynigen
287. Sarah Vega-Liros
288. Lee Venolia
289. Carrie Waara
290. David Wagner
291. Kara Walsh
292. Stephen Warley
293. Jennifer West
294. Kaatje White
295. Rob White
296. Gareth Williams
297. Kira Williams
298. Luke Williamson
299. karin winter
300. Chris Winters
301. Alan Wolf
302. Peggy Wolff
303. Tom Wolff
304. Lora Wondolowski
305. Scott Wrigley
306. Caleb Wursten
307. Elaine Yanow
308. Li Yu
309. Mark Zaccheo
310. Chelsea Zhang
311. Wendy Zunitch
312. Zoom User
313. Zoom User via Phone 1
314. Zoom User via Phone 2
315. Zoom User via Phone 3

Appendix A – Additional Public Comments Received

Question	Asker Name	Answer
Hi, will we be able to receive this slide deck of very helpful information? Thank You!	David Dewey	Hi David, materials from this meeting (including the presentation and video recording) will be available on the study website: https://www.mass.gov/northern-tier-passenger-rail-study
I just wanted to mention that some people who wanted to be on this call unfortunately are not because of Maundy Thursday services. Thanks	Jim Mahon	Thank you, Jim.
I apologize if this has been discussed and I missed it. Are there analogous plans being developed for Springfield (or Worcester) to Boston (or is there no track available to work with)? If they are conceivable, how do they compare for financial feasibility?	Barbara Pearson	Hi Barbara, the East-West Passenger Rail Study assessed rail service alternatives along the Boston-Worcester-Springfield-Pittsfield corridor. For more information, please visit: https://www.mass.gov/east-west-passenger-rail-study
Was their a choice of metrics for the benefit cost analysis or is it federally mandated? If it's not mandated why not include the impact on individual's health from driving? Not to mention the fact of climate change and it's devasting impact on the economy of places vulnerable to climate change?	John Garrett	The benefit-cost analysis methodology comes from the USDOT Benefit-Cost Guidance for Discretionary Grant Programs
there*	John Garrett	
Given the scarcity of public transportation options in western MA, would it be possible that the estimated real estate value increases extend over a greater geography than "normal?" Greatly appreciate this presentation, thank you.	Suzanne Stinson	As part of the alternatives development and analysis, catchment areas around potential stations were developed to assess trip-making and estimate ridership and related analyses.
Would there be a westbound train? I read that they want to do 5 eastbound trains a day, but what about Westbound trains?	j Deery	Hi j, yes westbound movements for trains would occur.
As a former school committee member during a time of declining enrollment, I	Joe Kurland	Thank you for your comments, Joe.

see an increase in population as a boost to our schools. It would improve the cost per student numbers.		
The frequency of ise storms (vs.snow storms) has increased dramatically in the past few years as our climate changes within the northern tier towns. Do ice storms impact the Electric Service #3 Alternative more than the non-electric alternatives?	CM Deucher	Please note that Alternative 3 includes electrification elements, including overhead catenary.
Hi, thanks for all this! I wondered about the VMT modelling. In northern Berkshire County and in Franklin County, many people going to the Boston metro area do not take Route 2--they go down to MassPike and then turn east. Any surveys out there on this?	Jim Mahon	Please see the Public Meeting #1 presentation for information on North Adams to Boston route choice.
For the link option, is the existing MBTA schedule expected to absorb the additional riders arriving from the west for the transfer, or will additional MBTA capacity need to be considered to accommodate through passengers all the way to Boston?	Zoe Danger	Alternative 6 (the Northern Tier Rail Link) assumes the existing MBTA schedule for connection at Fitchburg.
Thanks for all your great work on this project so far! Can you share how your report will assess the potential “economic, employment, social and cultural benefits to Franklin and Berkshire Counties and the commonwealth as a whole” beyond the construction and property value impacts?	Paula Consolini	Please see the Public Meeting #3 presentation on slide 18 for estimated economic and employment information. As part of the alternatives development and analysis, attractors were identified and all alternatives were estimated to provide connectivity, mobility, and choice. The study’s report will document the study process, including the alternatives evaluation analyses.
P.S. I was quoting item viii in the legislative mandate for the study.	Paula Consolini	
I hope this can become reality, and I hope the Plan #3 Electrified rail is the one chosen. I have lived in Petersham, near Athol and Gardner for 46 years and in the beginning there was some	Karen K Davis	Thank you for your comments, Karen.

rail service from Athol/Gardner and it so sad to see it go. I think this area needs this rural development/transportation. Our area had the 5 or 6 Quabbin towns that were flooded to create the Quabbin reservoir , and now these rural communities that are left deserve some resources. PLEASE DO THIS KarenDavis		
Just a comment: I work at Williams College (and worked at MCLA for 11 years) and don't have a handle on ridership numbers, but this would be so beneficial to our students from the greater Boston area. Very excited to track the progress of this project (pun intended).	Kate Heekin	Thank you for your comments, Kate.
Any chance u could please go over again the overall economic impact ? i thought i saw on the chart that across the board it was negative ?	Marilyn O'Neil	Please see the Public Meeting #3 presentation for evaluation summary, benefit-cost analysis, and additional information.
are copies of this presentation available	Francis Abuisi	Hi Francis, materials from this meeting (including the presentation and video recording) will be available on the study website: https://www.mass.gov/northern-tier-passenger-rail-study
Does the negative Benefit-Cost ratio suggest a low likelihood of implementation? The slide suggested none of the alternatives would be competitive for "discretionary grants under current federal rules."	Caleb Wursten	Regarding the benefit-cost ratio, changes to the project's characteristics, conceptual costs, and benefits may impact the benefit-cost analysis. Evaluating alternative phasing or implementation strategies is included as part of the draft recommended next steps.
Would there be a westbound train? I read that they want to do 5 eastbound trains a day, but what about Westbound trains?	j Deery	Hi j, yes. Westbound train movements would occur.
Does "5 trains daily" mean 5 trains each way or 2 trains one way and three trains the other way?	Robert heller	The proposed alternatives each were developed to provide five round-trips.

Comment (no reply necessary): I am very impressed with the thoughtful and well informed professionalism behind these studies, and I am grateful for this public presentation. Any of options 2-5 would be wonderful (#1 and #6 would not merit the money or effort). I strongly support this important initiative to bring passenger rail to the North Adams-Boston corridor. Thank you.	David Wagner	Thank you for your comments, David.
Do you have an energy use estimate with each alternative?	Patricia O'Neill	An assessment of estimated energy use could potentially be examined as part of this or any future planning activities.
Also, appreciate the analysis that the addition of rail may lead to an increase in population instead of decline in Western MA. This is a really imporant point.	Lora Wondolowski	Thank you, Lora.
I don't have a question, but I wanted to express my strong support for this project. I don't think the extension to Albany makes sense at this point. But Alternatives 3 and 4 seem the best from the perpective of a resident in Williamstown, MA.	Antonia Foias	Thank you, Antonia
Did the build/operation costs for Alternative 3 (electrified) only evaluate adding overhead catenary on the existing freight right of way or was a sub alternative explored for electrifying the vehicles themselves instead? Hydrogen fuel cell trainsets (currently built in America) can offer zero emission transit with the needed range without the large upfront capital required -- was that option evaluated as part an "electrified" alternative?	Rauley Caine	Rolling stock costs associated with overhead electrification were estimated.
Discount at 7% for East-West vs 3% for Northern Tier?	Leo Quigley	The benefit-cost analysis methodology comes from the USDOT Benefit-Cost Guidance for Discretionary Grant Programs. Please note that carbon dioxide

		emissions is the only metric discounted at the 3% rate.
Thank you for this careful work. I’m confident that my household in Williamstown would make use of this service.	Jim Kolesar	Thank you, Jim.
I think this service is a huge improvement to all the communities this serves! Also I think more local government advocacy for the rail service would help gain community support for the implementation as well. In addition what is the time line for the implementation of the rail service.	Matthew DiGennaro	Thank you, Matthew.
What kind of improvements (if any) would need to be done at North Station in Boston in order to accomodate the new trains on this route?	Ben Comeau	The alternatives assumed no modification to MBTA infrastructure.
Can you clarify how tourism (either westward bound or eastward bound) is or isn’t included in the estimated possible ridership in the different alternatives?	Molly Rideout	One of the objectives of the study was to improve connectivity and access to destinations (e.g., jobs and services, academic institutions, tourist attractions, etc.). As part of the alternatives development and analysis, attractors were identified and catchment areas around potential stations were developed.
Can you describe where the layover in North Adams would be and how large the yard would be?	Leo Quigley	Considerations related to a potential layover facility are included in the Public Workshop presentation on slide 56.
We are certainly in favor of Northern Tier Rail and its potential to support population growth in our smaller towns and its potential positive impact on our travel and tourism industries, as mentioned in the state's Economic Development Strategy. -Mikael M. Pyrtel, Director of Economic Devlopment, Town of Orange, MA	Mikael Pyrtel	Thank you, Mikael.

As someone who lives in Williamstown, I echo those sentiments (including the stop in Williamstown!). Between tourism & higher education, there is a high level of interest in having train service to our region. Service from Boston with the Albany extension would be incredible. I strongly support the electric option (3, I believe) for the environmental and health benefits.	Christine Seibert	Thank you, Christine.
Following up on the question from the official from Acton, we should be aware of the new Amtrak standard locomotives known as the Siemens Charger, which are dual mode with both diesel and electric motive power.	Clint Richmond	Thank you for your comment, Clint.
YES to the Williamstown stop! It would also connect folks all along the route to the Clark art museum, Williamstown Theater Festival, and Peter Pan bus to NYC.	Kate Richardson	Thank you, Kate.
I fully support this project and look forward to taking the first train from North Adams to Boston.	Ashley Shade	Thank you for your support.
The Williamstown Stop would also connect folks from Southern Vermont via the Green Mountain Express bus service, which terminates in Williamstown	Kate Richardson	Thank you, Kate.
Is there a publically accessible, on-line location to view the information/data underlying the conclusions set forth in the charts displayed this evening?	William Kolis	Please see the Public Meeting #1 and Public Meeting #2 presentations for additional information. The study's report will document the study process, including the alternatives evaluation analyses.
I want to echo what others have said about how incredibly valuable this service would be to our rural communities allowing for increased business, recreation, and population. Also connecting the East and West could have such a profound impact on the state.	Patricia Duffy	Thank you, Patricia.

We are very supportive adding as many rail stops as possible in the corridor. We see having rail service as opening up the region to greater economic and population growth, and connecting the recreation opportunities to other parts of the state.	Sarah Vega-Liros	Thank you, Sarah.
Since the benefit cost ratio is low, I wondered if you looked at the expense and ridership of simply extending the Fitchburg line to Athol 5 times a day and to extend new trips from north Adam's and Greenfield to Springfield and Boston on lines with infrastructure already upgrades already underway	Christopher Parker	Regarding the benefit-cost ratio, changes to the project's characteristics, conceptual costs, and benefits may impact the benefit-cost analysis. Evaluating alternative phasing or implementation strategies is included as part of the draft recommended next steps.
Could you share on Zoom the slide with the "scoring" of the alternatives again?	Suzanne Stinson	Hi Suzanne, materials from this meeting (including the presentation and video recording) will be available on the study website: https://www.mass.gov/northern-tier-passenger-rail-study.
I'd be thrilled if I could take my bike on a train out to the Berkshires and then bicycle back to Colrain.	David Greenberg	Thank you, David.
As another Williamstown resident, I also wanted to express my support for this project. I travel to Boston several times a month, and I am sure that not only will I use this service, but many of my neighbors will as well.	Elaine Hantman	Thank you, Elaine.
I just want to build one what others have said, this sounds like an awesome project! It will help communitys that are dieing to get new life! As a railfan myslef, this would be awesome to watch this line get more life!	j Deery	Thank you, j.
It seems unlikely the ridership/cost of construction analysis will support or justify the actual construction of passenger rail service to North Adams. Having said that as a business person in Berkshire County, I look at this	William Kolis	Related to advocacy, please connect with your community leaders and elected officials regarding this effort.

project as an economic development opportunity. So, what can loacal businesses do to make known their thoughts on the economic imoprtance of this project to the Berkshire Region?		
Another Williamstown resident in favor of this idea. Thanks!	MaryDelia Marshall	Thank you, MaryDelia.
I was late. Are the slides posted anywhere?	John Anhalt	Hi John, materials from this meeting (including the presentation and video recording) will be available on the study website: https://www.mass.gov/northern-tier-passenger-rail-study
According to the analysis I did, it would be faster to get to Boston from North Adams and Greenfield by going down to Springfield and East through Worcester to South Station	Christopher Parker	Please see the Public Meeting #1 presentation for information on North Adams to Boston route choice and average travel times.
As someone planning to move to Williamstown later this year, having a train service connecting Albany to Boston passing by our town really excites me. I really hope this project moves forward rapidly!	Betul Pamuk	Thank you, Betul.
Was there any thought about double-tracking the whole route?	John Ridgway	The study alternatives developed aimed to minimize or avoid impacts by remaining within the existing right-of-way.
There are dual mode — electric/diesel locomotives to use if the MBTA electrifies before. the western sections.	Joe Kurland	Thank you for your comment, Joe.
As a Western Mass resident, I would absolutely love to see both the Northern Tier and the southern West-East rail created, with north-south connections, such as the Amtrak line between Brattleboro and New Haven. It would be a dream come true. I strongly support the enhanced local service to increase ridership and usefulness, and electrification. There are grants such as the CPRG that could be applied. We're moving in the	Helen Harrison	Thank you, Helen.

direction of electrification generally, and this would make the most sense for our climate and for forward-thinking infrastructure that aligns with our statewide renewable energy goals.		
5 trains a day in both directions? Or just in one way?	j Deery	Hi j. Both Eastbound and Westbound train movements would occur.
Many thanks to all involved in tonight's presentation. Another Williamstown resident expressing support for this project.	Hugh Pyle	Thank you, Hugh.
did the study consider making an offer to acquire the right-of-way from current owners? the budget for track upgrades is approaching the $600M pricetag for the acquisition of Pan Am Railways, which includes other rights of way	Christopher Silvia	Please note that freight service would still continue to share tracks with passenger service regardless of ownership.
Given that there are a number of political leaders from Western Mass present, I would like to ask them if there are any plans to densify the areas around the new stations to increase walkability?	Carl Sailor	Please connect with community leaders for additional information.
I want to second those who have called for more stations, especially stations near recreational area. could this study include seasonal stations similar to the Amtrak downeaster old orchard Beach station?	Christopher Silvia	Service to additional markets may be potentially considered or explored in a future effort.
Please can you find out how the values of the health/environmental health cost benefits of electrification are calculated in the federal 'black box', and share them with us all?	Paul Lipke	The benefit-cost analysis methodology comes from the USDOT Benefit-Cost Guidance for Discretionary Grant Programs
This would be a game-changer for Western Mass. What a vision. Thank you for your hard work in analzying the options and explaining them so clearly.	Chris Winters	Thank you, Chris.
thanks for the presentation. If travel time from Grennfielf to N station was no more than two hours, I wouild never drive to Boston again. even	roy kimmel	Thank you for your comments, Roy.

allowing for an additional 45 minutes to drive and park in Greenfield.		
As a member of our town Finance Committee, I know we continue to struggle to diversify our local tax base, and I would think that this project could be a very significant support to that. This would open up employment opportunities, particularly hybrid work opportunities, both retaining and attracting people to our community. How can we help and advocate further for this?	Suzanne Stinson	Related to advocacy, please connect with your community leaders and elected officials regarding this effort.
Will the track upgrades and construction require Eminent Domain to the thousands of homes stretching from Pittsfield to Greenfield to Leominster to Boston? And if not, then how can you possibly pull this huge rail infrastructure project off..?	Sean Thomas	The study alternatives developed aimed to minimize or avoid impacts by remaining within the existing right-of-way.
As a resident of North Adams, I feel this project would be hugely beneficial for the Berkshires, and the state in general. A North Adams or Williamstown stop would be particularly welcome. Train access to western Mass could help to alleviate high housing costs in Boston, as it would become possible to move further out from the city for daily commuters, expecially those who work on a hybrid from home/in office schedule. A scenario similar to commuters taking Amtrak from NJ to NYC on a daily basis is not unimaginable. Further, a professor at Williams College, I would use the train to take my students to the major art museums in Boston for teaching purposes. I attended grad school in Boston and it is probable that educators there would	Trenton Barnes	Thank you for your comments, Trenton.

use the train similarly, to bring students to view Mass MoCA and the Clark Art Institute. There are many similar opportunities for cultural and educational enrichment that may pertain to other fields.		
It’s so nice seeing all of the people on here, advocating for Western, MA. Let’s keep advocating for this project!	Andrew Fitch	Thank you for your support.
I hope thatt this project goes forward with a stop in Athol. It will be exciting to have train service along the Northern Tier Pat Larson in Orange.	Pat Larson	Thank you for your comment, Pat.
Speaking of stations, what is the plan for Greenfield where the current Amtrak platform serves only the north-south track with no access to the east-west track? The original Greenfield station used to be between those two tracks.	Joe Kurland	The study alternatives include proposed improvements, such as a new platform and reconfiguration of Greenfield Station.
Given the timeline you provided and the current stage of the project, what is the earliest projected year of the rail’s availability?	Carrie Greene	A sample implementation timeline is included in the Public Meeting #3 presentation on slide 35. Evaluating alternative phasing or implementation strategies is included as part of the draft recommended next steps.
Thank you so much for your hard work! We live in Greenfield and have a child who goes to school in Boston. She takes the train to Wachusett and we drive to pick her up when she wants to come home and do the reverse to send her back to school. A 2 hour train ride to Greenfield would be amazing, and many other families would benefit as well!	Shannon Collins	Thank you for your comments, Shannon.
As a resident of Berkshire County, I fully support this project! Thank you all for your planning and work on this.	Wendy Zunitch	Thank you for your comments, Wendy.
Just a reminder.... The residents in South Florida never thought "regular" people would ride the train. Please note that Brightline (public/private)	Alice Bojanowski	Thank you, Alice.

goes between Miami and Orlando very successfully!! Thank you.		
Big Thank You to Paul for his thoughtful and detailed answers to the questions regarding the obvious need for a broader economic development benefit analysis beyond the project construction period benefits and the relatively narrow federal BCA guidelines. I would recommend MassDOT look at the public 2005 and 2023 Maine DOT economic benefit reports relating to the Downeaster Amtrak line that runs from Maine into Boston North Station and is coincidentally the same length of rail ine as NTIER. Many thanks again to MassDOT and their team for this call. - Tom Green, Williamstown	Thomas Green	Thank you for your comments, Thomas.
How will colleges and universities along the corrdor be engaged with to better understand the demands as noted in next steps?	Matthew VanHeynigen	Stakeholders, including colleges and universities, would continue to be engaged as part of any future efforts.
Fabulous work; thank you so much for all your hard work. I would love to see this project go forward. I sometimes drive to Wachusett to catch the commuter rail, but it would be much easier to catch a train from Greenfield.	Nancy Grossman	Thank you for your comments, Nancy.
What are the next steps specifically in terms of state government approval? Is another bill going to needed to be passed on beacon hill to get the new rail link authorized?	Halley Kelly	The draft recommendations aim to continue advancing the remaining conceptual planning phase for this effort. Following the completion of the Northern Tier Passenger Rail Study, the final report will be filed with the clerks of the House of Representatives and the Senate, the House and Senate Committees on Ways and Means and the Joint Committee on Transportation.
There are no materials for today on the website except a flyer. Could you please post the slide deck. Thanks.	John Anhalt	Hi John, materials from this meeting (including the presentation and video

		recording) will be available on the study website: https://www.mass.gov/northern-tier-passenger-rail-study
No response required. I just want to thank you, all, for this excellent presentation and all of your hard work. Also, and this is just a small thing, but how cool would it be to once again travel by train through the Hoosac Tunnel!	Stephen Ferguson	Thank you, Stephen.
Thank you all for the presentation, questions, research and offering of information. The meeting is informative. The folks who have presented have been helpful. Makaela has been a delightful host.	Karuna Burgess	Thank you, Karuna.
This is VERY exciting! Another resident of Montague Center echoing the many comments on the game changing value of this rail to our area! Also have a strong preference for a new electric full local option (3+4). Also seconding Marcel LaFlamme's questions/concerns regarding how we could have BOTH a Springfield centered path and a Northern path along Route 2. Our family's sense is that people will make use of whatever is available, but if you build both paths there's potential for MUCH more dramatic uptake meeting the needs of our diverse rural and urban populations – we're curious to what extent ridership estimates and surveys account for what happens when the convenience goes WAY up (with connections between other services, more frequent trips etc, addressing last mile issues etc). A separate concern - I do wonder about the impact of increased housing prices on existing residents in Western MA and how that could be considered	Jennifer Atlee	Thank you for your comments, Jennifer.

and ameliorated (curious with regard to both Northern path and Compass rail)		
I echo all the thank yous, and absolutely, would use this service a few times a month for sure, from North Adams or Williamstown! Please let us know how we can help advocate for making this become reality!	Kenneth Kuttner	Thank you, Kenneth.
Thank you for a very informative presentation and proceess, which has been much improved from the inital planning of the Pittsfield to Boston route. As a western MA resident, it seems important to plan for north/south connections between the two lines, which would greatly increase their usefulness. Many local residents want to travel within this region, and not necessarily to Boston, and consideration of that perspective isn't always mentioned. Thank you!	Lucia Foley	Thank you for your comments, Lucia.
Thank you all so much for this forum and your work. When I see the bottom line on the chart for funding registering in the negative area, I wonder what can citizens do to help push the project forward despite the numbers coming up in the red? We all know that the almighty dollar speaks much lounder than people who are struggling with transportaion, I have hope that this could be overcome, and would value your guidance on what you've seen communitites do to secure funding depite these kinds of charts.	Sara Seinberg	Related to advocacy, please connect with your community leaders and elected officials regarding this effort.
I share the view of others that this would be a game changer for western Massachusetts while supporting more sustainable economic development and higher quality of life in the metro Boston area. Thank you for your thorough work and for taking the extra	Paula Consolini	Thank you for your comments, Paula.

time tonight to bring people up to speed!		
I do not have a question but wanted to add another political /economic reason for strong support of the Northern Tier. In Williamstown (where I live) and the rest of Northern Berkshire County, we often feel disconnected and cut off from Boston and the eastern part of the state by the Hoosac Range. As a result, we turn to Albany for news and media, medical care, entertainment, jobs, and transportation hubs. Many of us know the NY governor's voice better than our own governor's voice. With passenger rail service to Boston (which we had in my childhood), our attention and loyalties would shift toward our own state capitol and our state would be much better knit together.	Deborah Burns	Thank you for your comments, Deborah.
I am highly concerned about our ability to be resilient in the coming decades with the onset of ecological collapse, minerals scarcity (certainly it is impossible to transition our entire energy use to renewables/rebuildables at our current scale) and increased likelihood of supply chain breakdown because of these constraints. I hope that beyond economic growth, there can also be some visioning of what responsible planned degrowth looks like in our communties and how that might interact with trnasportation — even just as a contingency.	Patricia O'Neill	Thank you for your comments, Patricia.
Speaking from Greenfield, there's tremendous support for west-east rail in western MA for so many reasons. Thank you for your hard work.	Christa Pylant	Thank you for your comments, Christa.
Thank you all.	Joe Kurland	Thank you for attending, Joe.

MassDOT Virtual Public Involvement Comment Summary

Project Name:	Northern Tier Passenger Rail Study
Description:	Evaluation of passenger rail alternatives along the Northern Tier Corridor of western Massachusetts.

Comment 1

Name:	Megan Randall
Date:	09/13/2021
Response Requested:	Respond to me by e-mail

Comment:

Dear Ms. Niles, Having just belatedly read the Berkshire Eagle article on the northern tier passenger rail study, I would like to know when and where public meetings are scheduled. I am a southern VT resident who sits on the Planning Commission of Pownal, VT. I'm interested in carbon savings and bringing vitality back to small towns like ours, and believe passenger rail service would work toward both goals. Would it be timely to push the Planning Commission or Select Board to show support for this initiative? Has the Covid surge put a stop to public meetings, or will you proceed via Zoom? Thank you for including VT in this process. Megan Randall Pownal Planning Commission

MassDOT Response

Good morning Megan, Thank you for your email regarding the Northern Tier Passenger Rail Study. The first meeting of the study is anticipated to be held later this year. A study website will be established at the onset of the process that will host meeting information, including meeting dates, times, and platforms/venues. Best, Makaela

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Comment 2

Name:	Quincy Morgan
Date:	11/19/2021
Response Requested:	Do not send me a response

Comment:

Hello, I am writing in support of the recently-launched Northern Tier Passenger Rail Study. My immediate family and I live around Philadelphia, Pennsylvania, but we frequently visit relatives in Winchendon, Athol, and Templeton, Massachusetts. While the drive is long, tiring, and stressful, driving is often the only reasonable travel option due to a lack of rail in the region. While I have considered moving to Winchendon myself, and maybe starting a business there, as a young professional I am concerned about access to Boston, New York, and the rest of the Northeast. I strongly support new passenger rail across the northern tier and urge MassDOT to ensure the service is time-competitive with driving, runs frequently throughout the day, and has timed connections at Greenfield and Boston. Also, please consider a station in Baldwinville as a gateway to Winchendon (in addition to stops in Gardner and Athol). I would be happy to participate however possible as the study continues. Thanks!

Comment 3
Name: Flavia Mastellone
Date: 12/13/2021
Response Requested: Respond to me by e-mail
Comment:

Since I'm getting older, soon to be 68, and not in the best of health, driving to Boston from the Berkshires is more daunting to contemplate. If there were a passenger train, I'm sure I would have occasion to take it, particularly if I want to fly out of Boston.

MassDOT Response

We appreciate your interest in the study and thank you for your comment. All public input will be taken into consideration throughout the Study process.

Comment 4
Name: Rauley Caine
Date: 12/13/2021
Response Requested: Do not send me a response

Comment:

Any potential service from BOS to N. Adams must be coordinated with the regional transit authorities so that they can plan and fund bus services that meet trains at stations/satisfy train customer first-last mile travel needs. This service will be most successful when there is a strong system of bus routes to act as a feeder network to new stations. BRTA in North Adams and FRTA in Greenfield should be priority for new bus service funding as part of this program; seeing as MART in Fitchburg and LRTA in Lowell-area are already well serviced by regular MBTA commuter rail, those systems should have lower priority for any new bus service funding related to new train services. Any study of new rail service should always include a study of how customers will travel first-last mile both to/from new stations and their new train services. Regional Transit Authorities MUST be included in that discussion as a first priority, but better yet, and as an equal partner.

Comment 5

Name:	Jack Dunk
Date:	12/16/2021
Response Requested:	Respond to me by e-mail
Comment:	

Extend the Fitchburg line to south ashburnham ma

MassDOT Response

We appreciate your interest in the study and thank you for your comment. The Northern Tier Passenger Rail Study is a conceptual planning effort that will assess the feasibility of restored rail service along the North Adams-Greenfield-Boston corridor. Potential stops will be identified and evaluated as part of the study process.

Comment 6

Name:	Jack Dunk
Date:	12/16/2021
Response Requested:	Do not send me a response
Comment:	

Extend the Fitchburg line to Greenfield ma

Comment 7

Name:	Beverly Duncan
Date:	12/20/2021

Response Requested: Do not send me a response

Comment:

I have recently heard of the proposal to study the reinstatement of rail service east to west and back. I support the possibility of this service! The tracks are already in place. Please look upon this endeavor as worthy of moving the whole state into the 21st, and beyond, century.

I would use this service, occasionally for work, but also for personal reasons. What a relief to be able to use a mass transportation service that will move the state toward sustainability. Put our taxes to such programs, now!

Thank you for considering such a forward-thinking project.

Comment 8

Name: Bren Read

Date: 12/27/2021

Response Requested: Respond to me by e-mail

Comment:

The ex-B&M route being studied has considerable commuter, recreational, and intercity travel potential. Could the scope include: 1. Accounting for the post-COVID-19 pandemic New Normal of individuals moving to desirable less costly rural areas/small cities where they work from home but travel to their offices or for meetings/events. The beauty of the region and the communities on this corridor lend themselves to this new work pattern. Train travel permits safe, convenient access, along with an environment where one can work enroute. 2. Bicycles/ebikes as the New Mobility. They provide essential first/last mile mobility for work, visits, and recreational trips. Trains have the ability to easily and safely carry bikes/ebikes onboard with their users. Could well-marketed accommodation of them draw additional ridership and revenues? 3. A blended service pattern of at least two trains each way: inbound morning Boston train/afternoon return and outbound from Boston to northwestern Massachusetts in the morning, returning in the late afternoon. 4. Opportunities to develop ridership/revenues through expanding the reach of the service with other states/partners. Examples include: (a) Brattleboro-White River Jct./Hanover-Burlington area-Montreal by connecting with The Vermonter, planned extension to Montreal. There also has been suggestions to restore the overnight New York-Montreal train, following the recent return of overnight rail travel in Europe. The ex-B&M main line offers a shorter, faster, alternative than the ex-B&A through Springfield for Boston-Montreal service, given the longstanding disinterest by the State of New Hampshire in restoring the direct route through Concord, NH. (b) Potential service to Rutland via Bellows Falls. (c) Connection/terminus at Schenectady for Amtrak connections to western New York, Toronto (when resumed), Chicago, Plattsburgh, and Montreal (also when resumed) (d) Connection/terminus alternative at Albany/Rensselaer by way of North Adams and Pittsfield for Amtrak connections also to New York City as well as to western New York, Toronto, Chicago, Plattsburgh, and Montreal. (e) Amtrak Thruway/local partner buses to Pittsfield, also Bennington, VT, Keene, NH.

MassDOT Response

Thank you for your comments. All public feedback will be taken into consideration throughout the study process. Please see below for specific responses to your comments.

1. We plan to evaluate new and potential travel markets and patterns, including those arising from the COVID-19 pandemic.

2. We plan to develop six service alternatives and evaluate them for factors that include multimodal connections.

3. We will look at a variety of service patterns in the development of the six alternatives to determine which will serve the goals and objectives of the study.

4. In Section 84 of the 2020 state budget, the Massachusetts Legislature directed MassDOT to conduct a study of the feasibility of rail access between North Adams and Boston; potential multimodal connections will be factors in the development and analysis of the service alternatives.

Comment 9

Name:	Elizabeth Faxon
Date:	01/27/2022
Response Requested:	Do not send me a response
Comment:	N/A

Comment 10

Name:	Valerie Shields

Date: 02/05/2022
Response Requested: Respond to me by e-mail
Comment:

How can MA consider North Adams and Greenfield cities when there is no adequate northern or east-west train transportation linking these cities nor enabling tourism via the nearest major airports in Boston or Albany? For northwest residents and city-dwelling visitors who increasingly do not buy, rent or hire a car for environmental and/or economic reasons, there is no convenient and reliable way to travel north, east or west from even Pittsfield where the closest Amtrak operates. Merely funding infrastructure improvements even further south in Springfield ignores this major obstacle to regional equity, while the northern cities and towns feature an increasing number of tourism magnets and opportunities to rehab sustainable housing or commercial locations to improve quality of life.

MassDOT Response

Thank you for your comments. The Northern Tier Passenger Rail Study is a conceptual planning study that will evaluate the feasibility of passenger rail service between North Adams, Greenfield, and Boston. In addition to this study, other efforts including (but not limited to) the East-West Passenger Rail Study and the Berkshire Flyer aim to increase transportation options, support economic development and reduce emissions, among other goals.

Comment 11
Name: Drew David
Date: 02/18/2022
Response Requested: Respond to me by e-mail
Comment:

This project sounds great! Linking our communities by rail will give them better economic prospects and help combat climate change.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process.

Comment 12

Name: Jens Michaelsen

Date: 02/22/2022

Response Requested: Respond to me by e-mail

Comment:

Good Evening, I'm writing because this topic has been of special interest to me for quite some time. I believe that a highly successful rail corridor is crucial to our society. Further, I think that successful implementation has the potential to improve the Bay State's infrastructure beyond any competition if implemented properly. To that end, my suggestion requires multiple disciplines but is not overly complicated. It is in my opinion that taxpayers may disagree with the concept of a rail corridor. It is also in my opinion that the reason it has not yet been built is because the benefits do not overly outweigh the costs. However, I think in order to lower the costs we should recognize that we can improve on existing rail infrastructure through a few different mechanisms. First, a Public-Private Partnership (PPP). This doesn't seem all that revolutionary, but perhaps the implementation could be. Think: with Tesla's driving themselves down the Masspike and soon to be semi-trucks, couldn't we offer a safer alternative? That safer alternative could be a rail project that allows for Artificial Intelligence to route deliveries and/or the passenger cars appropriately with switching stations at designed intermediary points. Companies like Amazon could save on truckers, improve their status as defenders of the environment through electric rail, and also provide needed funds to make this investment palatable to taxpayers. My personal vision involves doing this on a more massive scale (for the same reasons, but also including things like insurance/accident reduction and reduced need for traffic patrols, reduction in maintenance costs- the list goes on and on), so I feel like using this as a starting point could really set the tone for the future of transportation. Next, a requirement that the project be built in conjunction with other critical infrastructure projects. Other infrastructure, such as electrical, fiber optic, or natural gas, could be on the same right-of-way, and ideally result in economies of scale for both the permitting and construction processes. This could be done through recognizing projects that exist (for example) with the ISO New England Regional System Plan, which outlines projects on the electric grid for the next ten years. Some communities have instituted dig moratoriums following the completion of major projects with success in forward-thinking infrastructure plans. I hope that you will consider either of these ideas in implementation of this rail project, or any other massive rail project in the Commonwealth. Thanks

MassDOT Response:

Thank you for your comments. The Northern Tier Passenger Rail Study is a conceptual planning study that will evaluate the feasibility of passenger rail service between North Adams, Greenfield, and Boston. In addition to this study, other efforts including (but not limited to) the East-West Passenger Rail Study and the Berkshire Flyer aim to increase transportation options, support economic development and reduce emissions, among other goals.

Stakeholder Reply

Name:	Jens Michaelsen
Date:	03/01/2022

Thanks for your reply, Lauren. While I do understand it is merely conceptual, I think adding in ideas to shift the cost-benefit analysis may actually tilt the scales much higher towards the side of the project being built. We have seen quite a few of these projects end up not being built, and my comments are for hopeful in the direction progress in the form of iron in the ground. Further, I think the other proposed rail corridors (South Shore) may benefit from similar mandates. Thanks again! Jens

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Comment 13

Name:	William Johnson
Date:	04/16/2022
Response Requested:	Respond to me by e-mail
Comment:	

I would be interested in the northern tier rail connection.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 14

Name:	Adam Simon
Date:	05/28/2022

Response Requested: Respond to me by e-mail
Comment:

It is a real shame that Eastern and Western MA are so disconnected by public transit. It is easier to get to NYC and VT from the Pioneer Valley. This should not be the case. Western and Eastern MA should be united by this already existing rail line for the benefit of the whole state of Massachusetts.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 15
Name: Joe Kurland
Email: yosl@ganeydn.com
Response Requested: Respond to me by e-mail
Comment:

Will a transcript of today's zoom meeting be available?

MassDOT Response

Thank you for your comment. Meeting materials, including the video recording with the transcript, will be made available on the study website.

Comment 16
Name: Sophie Michaux
Date: 06/23/2022
Response Requested: Respond to me by e-mail
Comment:

I commute from Conway to Boston 1-2 times a week for work, and a train to Boston is no brainer to me. I know many people who do the same thing and it would really add to the quality of life for everyone along that rail. People could travel from Greenfield to North Adams, and there is no doubt that that connection alone would help the cultural and economic vitality of the valley. Many people in Western Ma are concerned with carbon footprint, and don't travel as much as they could because they have to drive. The fact that I can more easily get to NYC then to Boston via train is shocking to me. Let's unify Massachusetts, and lead the way in terms of public transportation!

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 17

Name:	Kaymarion Raymond
Date:	06/29/2022
Response Requested:	Respond to me by e-mail
Comment:	

it's gotta stop close to me, that would be Athol, and allow me to take a day trip to Boston for medical treatment or events or just visits, or get mass transit to the airport. handy to have connections to worcester as well..

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 18

Name:	Doug Brown
Date:	07/01/2022
Response Requested:	Respond to me by e-mail
Comment:	

Similar to how the East-West Study looked at all intermediate communities, it is important that the Northern Tier Study do the same. For example, with both residential and commercial development increasing greatly at Alewife, the study should be sure to consider the potential for a new rail stop there. This would allow commuters from western Massachusetts to access jobs at Alewife without needing to drive or backtrack on the Red Line from Porter Square. At the same time, it would allow new Alewife residents to reach western Massachusetts without driving. The City of Cambridge has long desired just such a station, and easements for the siting of such a project were first established in 1989 and remain in effect to this day. Please add this to your study, as the ridership numbers used previously here are extremely dated by now. Thank you.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 19

Name:	Benjamin Greenfield
Date:	07/05/2022
Response Requested:	Do not send me a response
Comment:	

I live in Williamstown, MA. and it is impossible to plan a work day in Boston from Williamstown using mostly public transportation. I can do this from Williamstown to New York City. I think the largest economic potential for Massachusetts is the the under utilized land in between Boston and Williamstown along the northern tier. The ideal public rail system will help housing prices in Boston stabilize by making it possible to get from all the small communities along the northern tier. The small communities will benefit from access to the jobs along the northern tier feasible. This 2 factors will have ripple effects that would provide a generation of smart growth.

Comment 20

Name:	Mary-Ann Palmieri
Date:	07/05/2022
Response Requested:	Respond to me by e-mail
Comment:	

As older residents of New Salem, passenger rail along the Northern Tier Corridor would provide access to medical appointments in Boston as well as cultural events in Boston and North Adams and would definitely enhance our quality of life as we try to age in our home.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 21

Name:	Ann Stewart
Date:	07/06/2022
Response Requested:	Respond to me by e-mail
Comment:	

Please build a Fitchburg rail line stop at the Alewife T stop in Cambridge. This area is rapidly undergoing considerable residential and commercial development. I wish that massDOT would get ahead of this situation. Thank you.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 22

Name:	Eric Grunebaum
Date:	07/08/2022
Response Requested:	Respond to me by e-mail
Comment:	

The East-West Study looked at all intermediate communities and it is critical that the Northern Tier Study do no less. For example, with billions of dollars of both residential and commercial development completed and more underway in the Alewife area of North Cambridge, the study should consider the need for a new rail stop there. Essentially a new city is being built in this area of North Cambridge and a rail stop there would allow commuters from Western Massachusetts to access jobs at Alewife without cars or a need to backtrack on the Red Line from Porter Square (which most people will not do.) The Rt 2/Rt 16 intersection has been identified as having two of the top five worst congestion periods in the state: www.masslive.com/news/g66l-2019/08/f50108901d1916/these-are-the-most-congested-roads-in-massachusetts.html People need not car alternatives. A rail stop in this location would also allow new Alewife residents to reach Western Massachusetts without driving or commute to jobs in the North Station area. The City of Cambridge has long desired a station here and commissioned a study in 2015 (completed by HDR) suggesting that the numbers already justified a stop. Easements for the siting of such a project were first established in 1989 and remain in effect to this day. Please add this to your study, as the ridership numbers used previously are extremely dated and should be updated. Thank you for your consideration.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Stakeholder Reply

Name:	Eric G.
Date:	07/14/2022

Thank you Lauren!

Comment 23

Name:	Richard Jaffe
Date:	07/12/2022
Response Requested:	Respond to me by e-mail
Comment:	

We live on Monterey. The rail service to NYC from Pittsfield would not be of any interest as it would be quicker to go to Wassaic for Metro North or Hudson for Amtrak. Rail service on the Housatonic line through Danbury or Southeast we would definitely use

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 24

Name:	Carol Betti
Date:	07/12/2022
Response Requested:	Respond to me by e-mail
Comment:	

We desperately need rail service from North Adams to Boston. Right now the only way we can get to Boston is to drive to Vermont and take Cape Air.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 25

Name:	Jim Reische
Date:	07/12/2022
Response Requested:	Respond to me by e-mail
Comment:	

The NTC would be a huge boon to Massachusetts for tourism and business travel. The benefits won't only flow to western MA. The ability to easily get back and forth across the state would enable folks from the west side of the state and even eastern NY to get to Boston without the misery of the Mass Pike. The population centers are well situated along the route, making it easier to connect the dots (as opposed to when I lived in rural central IA, and Amtrak's interest in a line from Chicago through Des Moines to NE and CO was blunted by the low population along so much of that route). This opportunity would be a huge boon economically, environmentally, culturally and politically!

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 26

Name:	Vicky Layden
Date:	07/13/2022
Response Requested:	Respond to me by e-mail
Comment:	

this is a needed service. We pay taxes out here and we deserve to have the option to take the Trian into Boston.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 27

Name:	Adam Hughes
Date:	07/13/2022
Response Requested:	Do not send me a response
Comment:	

Please for the love of god do this rail service it's so desperately needed.

Comment 28

Name:	Hulda Jowett
Date:	07/14/2022
Response Requested:	Respond to me by e-mail
Comment:	

When I was a youngster I used to wave as the Minute Man, a real passenger train, with an actual dining car went through North Adams on its way to Boston. When I was in high school I would take the Budd liner (one car) to visit friends near Boston. When I moved back here in the ‘60’s I could at least get a bus to Boston. Then...nothing. I got pretty good at timing my drives into the city and could be in Boston in less than three hours from NA. Then traffic got so heavy that no matter what hour I left home it was a traffic nightmare from Concord on in. I don’t go to Boston anymore. In Europe I have traveled on the TGV (high speed rail). The time and convenience are amazing. We should aim for passenger rail at a minimum.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 29

Name:	Sherri Thomas
Date:	07/14/2022
Response Requested:	Respond to me by e-mail
Comment:	

Our family is in support of passenger rail. A daily link to Boston would be wonderful, as would a daily commute back and forth to NYC. Please move forward with expanding passenger rail in the Berkshires.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 30

Name:	Mollyann Tabachnikov
Date:	07/14/2022
Response Requested:	Respond to me by e-mail
Comment:	

I am very much in favor with any facet of mass transportation that makes it easier to connect from the Berkshires to either Boston or New York City. It will be interesting to see the schedule and the estimated time for travel. I would also like to see MassDOT work to connect Metro North to the Pittsfield station, in order to facilitate travel between our area and NYC.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 31

Name:	Roy Kimmel
Date:	07/15/2022
Response Requested:	Respond to me by e-mail
Comment:	

I listened to to zoom meeting about the Northern Tier Passenger study and want to thank those who are working on it. My comments: I do not see where there would be enough demand for multi car train service in the mid and western sections, considering the projected diminishing populations and jobs in those areas. But what I do see are individual self propelled cars like the Budd cars used back in the 1950s and '60s. An update of such a vehicle would be battery powered, not diesel. Considering the low rolling resistance on rail, such electric type rail cars could have enough battery power to cover the entire route, with charging occurring overnight. Depending on occasional peak demand, two or three of these cars could be lashed together. These cars would have a tilting capability to provide reasonable speed in curved sections. No expensive overhead electrification infrastructure or curve straitening required. Yes, new rail, where require, for a smoother ride.

MassDOT Response

Thank you for your comment and for attending the Public Information Meeting. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 32

Name:	Casey Gardiner
Date:	07/15/2022
Response Requested:	Do not send me a response
Comment:	

I live in the North Berkshires and would personally use this rail route at least quarterly, and I imagine I would have visitors in parties of 1-5 using it at least monthly. However, for this to be a viable transportation option, the line needs to run frequently enough (e.g. minimum of 2 departures in each direction each day, ideally more) for people to reasonably use it. The current Amtrak line to Pittsfield is nearly unusable because it only runs once daily and not at sensible times for people with traditional jobs or leisure plans. If there were a more limited set of departures available on this Northern Tier line, it might make sense to align with the weekend and work week (e.g. departures in EACH direction on all of the following: Thursday evenings, Friday afternoons/early evenings, Sunday afternoon, and Monday morning). Please solve for the transit needs of passengers going in both directions; given the schedule, the Berkshire Flyer pilot program to Pittsfield seems like it is solving for New York residents traveling to the Berkshires but not Berkshire residents going to New York unless they are staying for a week.

Comment 33

Name:	Alexis Loyd
Date:	07/15/2022
Response Requested:	Respond to me by e-mail
Comment:	

Having quick, reliable transportation between the Berkshires and Boston would be a game changer for the area. We moved to the Berkshires a little over a year ago and love it. The one concern I have about staying long-term is the lack of train transportation. It makes it much more difficult for visitors to come see us.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 34

Name:	Robert LaTracmouille
Date:	07/15/2022
Response Requested:	Respond to me by e-mail

Comment:

There was a comment from, I believe, a town official in North Adams suggesting need to make connections to New York. As I commented during the session, your data seems to show a much greater need in Western Massachusetts north - south than west - Boston. I made three such comments through the comments. After my first comment was censored, I gave up on the event. My basic comment was that it looks like western Massachusetts would be better served with north - south / west connections, as is the apparent situation in southern Massachusetts in that New Bedford and Fall River have obvious connection to Providence which is ignored in planning. "Providence" was censored in reading the comment. I will be very interested in seeing statistics on the "temporary" South Coast line. My guess is that the big winner will be Brockton. It will be very interesting to see if that result is equally ignored if the "permanent" route is finally selected. What would make senses, BUT NOT BENEFIT BOSTON would be service between Brockton and the South Coast on its own merits. Would it die?. It seems that the big problem in the west and the south is that Boston area entities are not interested in policies which TRULY benefit west and south rather thAN primarily benefit Boston at the expense of the policies which benefit west and south. That is very distressing.

MassDOT Response

Hello Robert, thank you for attending and participating in the Public Information Meeting. This particular study is only funded with the purpose of examining the feasibility an east-west connection across the Northern Tier of Massachusetts. We appreciate your concerns and encourage you to continue to engage with our team and sign up for study updates, if you haven't already.

Comment 35
Name: Alexander Barguendo
Date: 07/18/2022
Response Requested: Respond to me by e-mail
Comment:

Please restore regular, frequent, comfortable passenger rail service. As a holder of a Harvard PhD in Economics and a former Chief of Research at the Texas PUC, I can attest that simple analyses of the types used on the East-West rail analyses are not adequate to capture benefits for this type of project. Enormous net benefits of the "we must build it and nudge the direction of resource use and growth and infrastructure" type are obvious in this instance.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 36
Name: Frances Arnold
Date: 07/28/2022
Response Requested: Do not send me a response
Comment:

As a New Salem resident I would love to take a train to Boston or Williamstown for a day/night and for exploring towns in between. My partner commutes daily to Concord and has mentioned the increase in traffic since the pandemic. If there were enough trains running to allow folks to commute, I know he would definitely take advantage of it.

Comment 37
Name: George LoCascio
Date: 08/04/2022
Response Requested: Do not send me a response
Comment:

This is such a great idea. It would make my life so much easier. I really have a hard time getting to work in metrowest from where I live. This would be huge!

Comment 38

Name:	Fred Daley
Date:	08/27/2022
Response Requested:	Respond to me by e-mail
Comment:	

We travel back and forth regularly in the summer and fall from our home just across the New York line from Williamstown to Wachusett, where we take the commuter rail to North Station and connect to the Downeaster to reach our seasonal cabin in Maine. We would much rather board at Williamstown or North Adams, or even Greenfield, than have to drive all the way to Wachusett, even if the train were slower than driving. On the train we can read, work, check e-mail or have a nap, whereas driving is just a big time sink. Of course we could drive straight through between upstate New York to Maine, but we'd arrive stressed out and exhausted. Please make it possible for us to spend more time riding and less time stuck behind the wheel.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 39

Name:	Shaun Suhoski
Date:	09/27/2022
Response Requested:	Respond to me by e-mail
Comment:	

Resumption of Northern Tier service would be an extremely beneficial development for the region. The study should also consider the potential for self-propelled passenger rail cars if there are segments where the grade or ridership may not support full-fledged commuter rail.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the Study process. Please visit the Study website for additional information or to sign up for updates as the Study progresses, if you haven't already.

Comment 40

Name: Arthur Strang
Date: 10/03/2022
Response Requested: Respond to me by e-mail
Comment:

I suggest the following alternative levels of transit service, rather than the two reported in the Globe. 1) The level of service provided by Metro North? Metro North, NY provides one hour service (60 minutes) to a Croton, NY from NYC 50 miles away. The Fitchburgh Line currently provides that service taking an hour and a quarter, 75 minutes. 2) A level of service comparable to the best in the world? 3) A level of service sufficient for housing development—comparable to that which produced significant(?) housing investment in Somerville? 4 A level of service sufficient to put a dent in the relative price of housing in Cambridge and other high housing costs in the Boston area? 5) A level of service sufficient to supply at least 50% of the starter-housing, and the low and moderate income housing as required by the projections of the City of Cambridge and other high cost housing places? Just a thought…one of the reasons why transit matters

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Stakeholder Reply
Name: Arthur Strang
Date: 10/07/2022
Response:

Sara S, You have the same first name and initial of my daughter. I do not doubt that any of the alternatives I suggested will cost more than ‘planned’. Still, other cities, and not just NYC, have that level of service.

Comment 41

Name:	Zane Lumelsky
Date:	10/07/2022
Response Requested:	Respond to me by e-mail
Comment:	

Passenger estimates must also include fare costs versus other mode costs to the traveler.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 42

Name:	Emily Crowley
Date:	11/06/2022
Response Requested:	Do not send me a response
Comment:	

I am a resident of Greenfield, MA and I am in support of connecting the western corridor with the states capital via rail service. Cars are dangerous, and more rail service can get less cars on the roads, alleviating climate impact. It would also be convenient for bringing industry to the area as well as convenient for students to be able to travel between here and the capital. It would bring western Massachusetts into the conversation that usually centers around greater Boston. If the fair share amendment passes, the money needs to go towards public education and transportation, which could go into funding this project and fixing the rails. We need to make it easier for people to live in our state, and our country. Cars are dangerous, expensive, and harmful for the environment

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Comment 43

Name:	Barbara Alexander
Date:	12/22/2022
Response Requested:	Respond to me by e-mail

Comment:

The language in the materials accompanying the study announcement of the requirements or hurdles that rail must meet for it to be a "...competitive option" is so wrong it is breathtaking to see at this point in a worldwide climate crisis, in a supposedly well-educated setting such as Massachusetts state government. The externalities issue means this language needs to be scrubbed and re-worked immediately. It is well-established that when externalities are properly accounted for, rail is vastly preferable to car or truck or air transport. However, when rail does not exist, it is not possible to begin offering the pricing that would move people out of cars, off planes, and so on. Any speculation about what they will do is just pie in the sky. If they fail to respond, they may need to be incentivized via gasoline taxes, or may find themselves incentivized by uninsurable risks near the coasts and other inevitable developments. If governments have failed to provide rail in the meantime, it will constitute classic "fiddling while Rome was burning." Shame on you for this framing.

MassDOT Response

Thank you for your comment. One of the study's goals is to minimize the impacts on public health and the environment from transportation and, as the study alternatives are developed, they will be evaluated based on the study goals and objectives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 44

Name:	Jennifer Vanwyk
Date:	01/08/2023
Response Requested:	Respond to me by e-mail

Comment:

I would ride this train weekly! But, I think that it would receive even more ridership if it connected all the way to Albany. I live in Franklin County and am looking at taking a job in Albany, this would allow me to do this and significantly reduce my gas emissions and would be much safer that driving in the winter. I would use this rail to get to Boston for flights. And my neighbor would use this to do a bi-weekly commute to Boston. I think this is a FANTASTIC idea, and more trains across New England would be a great use of our tax payer dollars.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 45

Name:	Emma Stamas
Date:	01/08/2023
Response Requested:	Respond to me by e-mail
Comment:	

This sounds like an excellent idea, Could these tracks need to be used for freight as well?

MassDOT Response

Thank you for your comment. Freight currently operates along portions of the Northern Tier corridor. As part of the evaluation criteria for the service alternatives, one of the objectives is to minimize impacts to freight rail operations. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 46

Name:	Barbara Jarrett
Date:	01/09/2023
Response Requested:	Respond to me by e-mail
Comment:	

Driving to Brookline to see our family is difficult for ma and my husband, ages 85 and 89.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 47

Name:	Barbara Jarrett
Date:	01/09/2023
Response Requested:	Respond to me by e-mail

Comment:

Rail alternatives currently are far too long and necessitate my driving instead. As I am 85, this is a risk to my health and safety! I have no other way to visit my family.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 48

Name:	Paul Hadley
Date:	01/09/2023
Response Requested:	Respond to me by e-mail

Comment:

Adding passenger rail would greatly aid in getting to Logan Airport from Shelburne Falls!

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 49

Name:	Xander McDonald
Date:	01/09/2023
Response Requested:	Respond to me by e-mail
Comment:	

I am disabled and this proposed route would be great to get to Boston for doctors appointments.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 50

Name:	Amy Teffer
Date:	01/09/2023
Response Requested:	Respond to me by e-mail
Comment:	

Yes! Please! This is essential for those that work and live along this line, especially working mothers.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 51

Name:	Teresa Siarnacki
Date:	01/09/2023
Response Requested:	Do not send me a response
Comment:	

This is a great idea-- would definitely use on trips to Boston instead of driving. Would be great if the rail could extend to Albany as well, to connect to the larger Amtrak network.

Comment 52

Name: Ruthann Rudel
Date: 01/09/2023
Response Requested: Respond to me by e-mail
Comment:

A link from Greenfield to Boston in one direction and Albany in the other would really enhance alternatives to private automobiles for people living or working in western Mass. The Albany link would connect this with Amtrack's hub there.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 53

Name: Joanne Garland
Date: 01/09/2023
Response Requested: Respond to me by e-mail
Comment:

Living in Greenfield, and traveling often, I have a special interest in being able to use public transportation to reach Logan Airport. In the past there were buses, but these are long gone.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 54

Name:	Unknown C.
Date:	01/09/2023
Response Requested:	Respond to me by e-mail

Comment:

Follow the old train lines rt 2 athol orange greenfield area needs rail. It will reduce alot of people's daily commutes. The service will bring more people to the area increasing economic viability that was destroyed when rt 2 bypassed the towns and the old rail services left the north quabbin region

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 55

Name:	Vinca Jarrett
Date:	01/10/2023
Response Requested:	Respond to me by e-mail

Comment:

We are desperate to have an easier and more direct way to get from Boston to Western Massachusetts with stops at the very least in Greenfield and North Adams. Right now it takes two or three transfers from Boston, and takes as long as 8 hours! This is ridiculous and adversely impacts the environment, as well as disparate communities who need better, more economic ways of travel.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 56

Name: Ezra Rudel
Date: 01/11/2023
Response Requested: Do not send me a response
Comment:

This seems like a great idea! I would definitely use it as someone who lives in Boston but frequently visits family in the Greenfield area and doesn't have a car. It would get even more ridership if it connected all the way to Albany, NY.

Comment 57

Name: Nicholas Wildman
Date: 01/11/2023
Response Requested: Do not send me a response
Comment:

This project is incredibly important and I know several people who would use this service for both professional and personal trips. Please do all you can to expedite this project.

Comment 58

Name: Michael Leary
Date: 01/11/2023
Response Requested: Do not send me a response
Comment:

A Northern Tier passenger rail service that runs from North Adams to Boston would greatly benefit the patients of the North Adams Campus of Berkshire Medical Center and the main campus of BMC. There are a number of local patients who have had to travel to Boston for second opinions or procedures that are not provided locally, and a Northern Tier service would allow these patients easy travel to the eastern part of Massachusetts, as many also have transportation issues including no access to their own vehicle.

Comment 59
Name: Ms. Avie Kalker
Date: 01/11/2023
Response Requested: Respond to me by e-mail
Comment:

For some reason, the GOOGLE (?) spinning colored ball BLOCKED my participation in the January 11 Webinar. I could not Vote, Raise My Hand, etc. I gave up on the Webinar and hope I can see it during the next few days. I do have a few questions, but I will raise them if I do not see/hear anything about them. I do need TECH help to avoid the spinning ball again. That is the first time that has happened to me while on ZOOM.

Comment 60
Name: Brendan Read
Date: 01/12/2023
Response Requested: Respond to me by e-mail
Comment:

Will or could your analysis look at two secondary markets that could add revenue to this service? 1. Boston-Vermont-Montreal: which has long been proposed. Amtrak is planning to extend the Vermonter to Montreal. The Northern Tier is the shortest existing route to/from Boston. 2. North Adams-Albany/Schenectady for not only connections to New York City but also to western New York State, Toronto, and Pennsylvania, Ohio, Indiana, and Illinois, also to Saratoga Springs, Plattsburgh, and Montreal. Mentioned on today's webinar while it was noted that the direct route via Troy no longer exists, it must be noted that the absence of one does not preclude its success. Witness Amtrak's New York-Pittsfield train via Albany--the direct routes from New York City to Pittsfield also no longer exist. One question: is it possible and economically feasible to restore the tracks from North Adams to Pittsfield?

MassDOT Response

Thank you for your comment. In Section 84 of the 2020 state budget, the Massachusetts Legislature directed MassDOT to conduct a study of the feasibility of rail access between North Adams and Boston. This conceptual planning study seeks to assess the economic and environmental benefits as well as any associated implementation challenges, and identify all necessary improvements to support restored passenger rail service along the Northern Tier. Potential stopping patterns beyond the study boundaries may be examined as part of this or a future study effort.

Comment 61

Name:	Robert Malanti
Date:	01/12/2023
Response Requested:	Respond to me by e-mail
Comment:	

After attending last evening's presentation, I submit the following comments: Construction of the project should begin in North Adams and head east to ensure Western MA receives the service connections lacking today. Ridership on the daily Lake Shore Limited from Pittsfield to Boston and the reverse should be reviewed as the Northern Tier proposals offered five train connections in each direction rather than only one. As echoed last evening, the catchment areas need to be expanded to capture demand.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 62

Name:	Carolyn Sellars
Date:	01/12/2023
Response Requested:	Respond to me by e-mail
Comment:	

Thanks for the great presentation last night. Two thoughts I had after the Webiner: 1. Is the electrification of this line being planned or considered? Replacing diesel engines would be woderful and good for public health. 2. I think the last training heading west from Boston was around 10 pm? Is that right? That seems too early to handle trips after events in Boston that often don't end until 10 or later. Seems like a 11:30 or midnight train might better.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 63

Name: Carl McKinney
Date: 01/13/2023
Response Requested: Respond to me by e-mail
Comment: This is a great start- but please do not loose sight of, at least in future phase- to connect the North Adams connection to Albany/Rensselaer, New York. As both an economic and practical matter to fail to do so will significantly reduce the potential success of regional economic cooperation and integration.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 64

Name: Jack Dunk

Date: 01/14/2023
Response Requested: Respond to me by e-mail
Comment:

Create train station stops at, south Ashburnham, Gardner, Athol, Orange, Millers Falls, Greenfield, and, North Adams, Massachusetts along the proposed northern tier railroad line corridor.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 65
Name: Richard Wiater
Date: 01/14/2023
Response Requested: Respond to me by e-mail
Comment:

https://m.youtube.com/watch?v=aIwbrZ4knpg Please look a this link it's about a maglev train. Why not build a maglev train from the berkshires to Boston?

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 66
Name: Richard Wiater
Date: 01/14/2023
Response Requested: Respond to me by e-mail
Comment:

https://m.youtube.com/watch?v=aIwbrZ4knpg Please look at this link.

MassDOT Response

Thank you for your comment. All public input will be taken into consideration throughout the study process. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 67

Name:	Cole Raineyslavick
Date:	01/15/2023
Response Requested:	Respond to me by e-mail

Comment:

I am writing in response to the first two alternatives. Both of these would be improvements over the existing total lack of service. The higher investment alternative clearly provides a superior level of service for a cost that is still quite reasonable when compared to highway costs. I would say however that both have similar shortcomings. The lack of a stop in Gardner a city of over 20,00 people, while providing stops in Greenfield, pop: 17,768, and North Adams, pop: 12,961, seems particularly strange from a ridership perspective, especially since Gardner also lacks existing commuter rail service. I would also advocate for considering stops in Athol, pop: 11,945 and/or Orange, Pop: 7,569 as stations could be placed in convenient downtown locations. A stop in Shelburne Falls is probably not justifiable on the basis of population but it is a popular tourist destination and providing a non-car option to travel there would be a boost for the town and provide cleaner alternatives for tourists. These added stops would also improve the potential of rail travel along the corridor that isn't oriented exclusively towards travel to and from Boston by providing providing an alternative to driving on along route 2. Please consider electrification along the route which would speed up travel times as well as providing environmental benefits, as this could help offset the time penalties of adding new stations.   It is amazing that the state is considering two passenger rail corridors to Western Mass. I hope this one is not lost in the momentum of the other East-West rail through Springfield. These corridors should not be seen as in completion, as they serve different parts of the state. They are also potentially complementary as both enable connections to the Vermonter, enabling travel to and from New York City, Philadelphia, D.C. and potentially in the future to Montreal. Both Also connect to the Valley flyer, enabling connections along the Connecticut river valley. The full potential of these services should really be considered together as part of an intercity rail plan for the Commonwealth. Service options should also ideally include consideration for timed transfers to other regional and inter-city trains in both Greenfield and in Boston. Please do this right, a poor quality service will not produce the mode shifts that we need to achieve decarbonization goals. This really could be a high level service that opens up currently transit starved parts of the Commonwealth to all kinds of destinations, please turn it into one.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 68

Name:	Kelly Cash
Date:	01/18/2023
Response Requested:	Respond to me by e-mail
Comment:	

I am moving to Heath, MA. I am from Canton, MA and my husband and I are now moving towards Heath to be closer to his aging parents. I work for State Street Bank out of Boston, we are now going back into the office 3x /week. It would be helpful if we could go in the direction of the more efficient plan of cutting travel times down to 3hrs, it's worth the $2b. I think 4hrs will definitely lose commuter ridership but, assuming this is not the intent. I would love to provide input from a commuter perspective. The talent pool in western MA is amazing, very educated people waiting for this so they may have an opportunity to work in Boston or places east. Please remember/consider western MA residents in decisions.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial

alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 69

Name:	Rauley Caine
Date:	01/20/2023
Response Requested:	Do not send me a response
Comment:	

As the service variations and recommendations are completed, we should be aware that there are many actors and interest groups who would like to scope-creep this project into something that it doesn't need to be. There is nothing wrong with having a (relatively simple) project that purposefully and primarily benefits residents of western and far-western Massachusetts. There should be no consideration of any unnecessary vanity rail infrastructure or station infrastructure; there should especially be no consideration for any rail service/station stops between Fitchburg and Boston. This territory is already covered by MBTA CR and should not be considered in the initial phases of this project - and honestly if ever considered, because these areas should focus on improving their existing rail programs instead of bogging down this fledgling service. Any considered service types in future planning should all consider running express between Fitchburg and Boston. This project should be, at least at first, constructed as cheaply and hastily as possible to get the service up and running. Then, we can focus on phase 2,3,4,5,6,7 etc. to build out the program service and infrastructure. Let's get this going with used or leased equipment, a private rail contractor like the Hartford Line, and wooden ADA-accessible platforms at as few stations as possible. Let's get this service off the ground quickly and THEN worry about building it into what we all know it really could be- amazing and transformative mobility option for WESTERN Massachusetts.

Comment 70

Name:	Judd Greenstein
Date:	01/27/2023
Response Requested:	Respond to me by e-mail
Comment:	

I live in Gill, near Greenfield, and frequently work in Boston/Cambridge. I would absolutely use this train regularly if it were provided in such a way that both day trips (leave AM, return

PM) and overnights (leave AM, return AM) were possible. This means including relatively late trains back in a westward direction (so one can go to dinner or even a show, get to the train station, and make the train —10:30 or 11pm, ideally), and relatively early trains westwardly as well, so that if one stays over, the first train gets one back in time to have a largely complete work day. Another consideration — it would be massively helpful to have a stop in Cambridge (Porter Square), so that one did not need to make the difficult train trip from North Station to Cambridge, or transfer at Fitchburg and ride nearly the entire duration locally, adding 30-40 minutes to the trip. Thank you!

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 71

Name:	William White
Date:	01/28/2023
Response Requested:	Respond to me by e-mail
Comment:	

As much as I am a fervent supporter of rail, the numbers don't look great - probably as this line connects only to secondary/tertiary destinations with low population density. Hard to imagine service of anything like five trains per day given how many potential routes there are that are still unserved yet have much higher population and rider potential - not necessarily in MA other than East-West. In looking further, I hope consideration is given to adding one station west of Boston to allow transfers from MBTA without backtracking to North Station.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial

alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 72

Name:	Kaymarion Raymond
Date:	01/28/2023
Response Requested:	Respond to me by e-mail
Comment:	

have a stop in orange or athol. people out here travel by car because there is no alternative. there are few jobs. affordable housing is near impossible to find. some of us are only recently getting internet service. building the economy would be great if if new businesses would follow reliable rail service. there is great manufacturing potential here to build a more self-sufficient economy with agriculture and wood products as well as developing a tourist vacation destinations. also, i live in wendell. I am old. but i will never try to drive to Logan airport ever again.Sometimes my family has to go for medical appointments in Worcester and Boston. i would love to go to WoSox games, visit friends in Stowe, attend cultural events in Boston, but driving to the east is difficult for me and the increasingly aging population of this town. and buses don't serve us. i am not going to Greenfield, let alone Springfield, to catch a train east. As for cost of this project, low population and poor areas like ours need to be valued and subsidized by servers. We have been penalized this way by phone/internet providers, buslines and by the medical industry, but we provide fresh air and clean water to the crowds of the east. Pay up before we secede from the Commonwealth :)

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 73

Name:	Lynne Feldman

Date: 01/29/2023
Response Requested: Respond to me by e-mail
Comment:

Please consider adding a station in the underserved North Quabbin area (Orange or Athol).

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 74
Name: Sidney Rothstein
Date: 01/30/2023
Response Requested: Respond to me by e-mail
Comment:

I would like to register my support for the rail line that will offer the fastest and most frequent service between North Adams and Boston. I recognize that optimizing service comes at a cost, but that cost will pale in comparison to the extensive benefits that rail service will bring to the region. I strongly endorse the high-investment option and encourage the project to move full steam ahead. I would also ask the project team to be more visible and vocal -- many folks out here don't know about this project, despite the massive benefits it would bring to them.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 75
Name: James Starkey
Date: 01/31/2023
Response Requested: Respond to me by e-mail
Comment:

I strongly urge that this study include service for Athol and Gardner, MA. These towns have grown in population greatly over the last 10 years with most new residents working and shopping to the east. Leaving a gap in service between GHreenfield and Fitchburg makes no sense. Drive Rrt2 East in these communities anytime after 4 AM and you feel like you're on 128 at rush hour with the reverse being just as bad. What were these two communities left out of the study with such an obvious need?

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 76
Name: Matteo Pangallo
Date: 01/31/2023
Response Requested: Respond to me by e-mail
Comment:

This is an essential project for the people of central and western Massachusetts. I am concerned, however, that the proposed map shows no planned station stops between Wachusett and Greenfield. This is a span of 46 miles; the average distance between stations east of Worcester County is just 5 miles. This is not equitable and it will lead to low ridership numbers. The communities on the proposed rail line between these two stations have about 85,000 people in total, not even including the people who live north and south of those communities. If the plan is to have the people of central and western Massachusetts utilize this line on a regular basis, and thus justify its cost, there must be a few more station stops in this part of the state.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 77

Name:	Walker Powell
Date:	01/31/2023
Response Requested:	Respond to me by e-mail

Comment:

I would like to strongly advocate for at least one station in the North Quabbin area (Orange/Athol), which is one of the most economically disadvantaged areas in the state and is often overlooked and passed over in state-wide projects. There is a large gap between the proposed stations in Greenfield and Fitchburg that leave out a huge number of people and communities that could really benefit from a local station.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 78

Name:	Edwin Ward
Date:	02/02/2023
Response Requested:	Respond to me by e-mail

Comment:

I was pleased to read the results of the Northern Tier Passenger Rail Study, and am excited for the potential economic, mobility, and climate benefits associated with the project should it ever be constructed. I am concerned, however, that much like with the East-West Rail Study two years earlier, MassDOT has artificially reduced ridership projections and increased construction cost estimates by completely ignoring the obvious connection available with New York. The freight line currently serving North Adams continues west until Mechanicville, NY, where it connects with the Colonie Main Line, a preexisting rail line that heads south through Troy, NY and into Albany, NY. The Albany metro area has a population of over 1 million, and already has an Amtrak crew base and layover facility, negating the need to construct a new one in North Adams. Furthermore, by taking a route through Troy, NY, the Commonwealth may find a willing partner in New York State. With a population of over 50,000 people, Troy hasn't seen rail service in over 65 years, and adding service through there would be in line with New York's transportation and climate goals. In addition to vastly increasing the number of potential riders on a Northern Tier Line by continuing to Albany via Troy, Amtrak could through-run Northern Tier equipment into New York City as part of its frequent Empire Service between Albany and New York. Such a service would foster unprecedented connectivity between Boston, western Mass, New York's Capital Region, the Hudson Valley, and New York City. Although few passengers would find the likely 7+ hour end-to-end trip time between Boston and New York via North Adams appealing, it would greatly induce riders between intermediate points along the entire route. The Northern Tier Line would be a better candidate for through-running to New York City than an East-West Rail Line through Pittsfield because the Northern Tier Line would arrive in Albany from the North, already facing South. Because East-West Rail will arrive in Albany from the South, those trains would need a second locomotive at the rear, or a cab car, to reverse direction for the trip to New York City. Ultimately, I think the 'higher investment' proposed alternative is well-designed in terms of stations within the Commonwealth and daily number of trips, but I urge MassDOT to work with NYS DOT to ensure any final proposal continues west to Troy, Albany, and through-runs to New York City. Assuming those extra stops (and riders) and the negated need for a layover facility in North Adams, I think MassDOT will find an even more attractive use case with far lower annual costs per rider. Thank you very much for considering my comments. Sincerely, Edwin Ward edwin.ward@bc.edu

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop four additional service plan alternatives, which may include potential stations beyond those included in the initial

alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 79

Name:	Fay Hsieh-Lewis
Date:	02/28/2023
Response Requested:	Respond to me by e-mail
Comment:	

Please have a stop in Athol, MA. It would greatly help with needed transportation accessibility. I'm concerned about the lack of accessablility for myself and other people who cannot or are not confident in their ability to drive into Boston (especially to North and South Station for connecting rides). I, and my peers, want to use public transportation but we can't if it's no physically. My concerns: - Most Athol public school students are impoverished. Accessable public transportation would give them more options for their future and enrich the community. It might increase racial diversity (since Athol is mostly ethnically white) - Being nearby. If I can only access a train station by car or by multiple buses that take an indirect route to the station then it's not accessable to the public - Public transportation that takes 2-3 times longer than riding in a car because the stations/stops are not close enough - Trains that arrive on schedule - Being able to add funds to your Charlie Card without having to go into Boston other than getting Charlie Cards by mail (Charlie Card machines and stores that adds funds) - A waiting area that's wheelchair accessible, provides rain cover, and has public seats for the disabled. An indoor waiting area would be amazing (coverage from freezing winter weather)

MassDOT Response

Thank you for your comment. One of the study's goals is to promote transportation equity. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop and assess four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 80

Name:	Antoinette Cariddi
Date:	02/28/2023
Response Requested:	Respond to me by e-mail
Comment:	

Is there a possibility of extending the rail travel from Pittsfield to Boston?

MassDOT Response

Thank you for your comment. The East-West Passenger Rail Study assessed rail service alternatives between Pittsfield and Boston. For more information, please visit: https://www.mass.gov/east-west-passenger-rail-study. Since the completion of the East-West Passenger Rail Study, the Western Massachusetts Passenger Rail Commission was established. For more information on the Commission, please visit: https://www.mass.gov/event/western-massachusetts-passenger-rail-commission-meeting-2022-12-09t110000-0500-2022-12-09t120000-0500.

Comment 81

Name:	Joanne Garland
Date:	03/01/2023
Response Requested:	Do not send me a response
Comment:	

I would so love to be able to take a train from Greenfield to Boston--to fly out of Logan Airport, to enjoy a day in the city, to research genealogy, to shop, to visit historic sites. Driving into the city is exhausting, to say nothing of the hassle and expense of parking.

Comment 82

Name:	David Moresi
Date:	03/31/2023
Response Requested:	Respond to me by e-mail
Comment:	

As planned second homeowners in Boston we would very much find this to be advantageous to our needs.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 83

Name:	Daniel Joudrey
Date:	04/29/2023
Response Requested:	Do not send me a response
Comment:	

Passenger rail would be a godsend to north central Massachusetts. I work in Boston, but the commute can be brutal. It would help to have alternatives to driving into the city.

Comment 84

Name:	Brian Lickel
Date:	04/30/2023
Response Requested:	Respond to me by e-mail
Comment:	

Thank you for your efforts on this. I strongly support rail service along this route!

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 85

Name:	Cole Raineyslavick
Date:	04/30/2023
Response Requested:	Respond to me by e-mail
Comment:	

The two proposed alternatives do not do enough to provide access along the route. Only adding two stations will limit ridership. It is downright bizarre to not include a stop in

Gardner, which has a higher population than Greenfield and North Adams. Athol also has a similar population to North Adams and would fill a large gap in the proposed service area. Athol and Gardner also appear to be the only communities besides Williamstown, which also does not have a proposed stop, to meet the minority criteria for environmental justice communities according to the map presented in January. Likewise they both have high concentrations of zero-car households compared to the corridor in general (Gardner specifically appears to have one of the highest concentrations) and also have areas that fit the income criteria for environmental justice communities. These stops in particular feel like no brainers to include and one has to wonder why they aren't already included.   Other stops that should be considered are Orange and Shelburne falls as they would serve relatively dense communities, both of which have areas that meet the income standards for environmental justice communities and have a relative prevalence of zero-car households (the Southern part of Orange appears to have one of the highest concentrations in the corridor). Shelburne Falls is also a popular tourist destination and a train that stopped there would allow more people to visit without a car, decreasing traffic and pollution.

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Feedback received will be used to develop and assess four additional service plan alternatives, which may include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 86

Name:	Zachariah Kisj-Degiulio
Date:	06/22/2023
Response Requested:	Respond to me by e-mail
Comment:	

Please make this happen! It would be a huge help for me

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 87

Name: Gail Bienvenue
Date: 06/28/2023
Response Requested: Respond to me by e-mail
Comment:

An east - west rail line is sorely needed in WMA.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 88

Name: Christine Copeland
Date: 06/28/2023
Response Requested: Respond to me by e-mail
Comment:

We travel to Boston frequently because our son lives there. The road is ok but dangerous to drive at night and sometimes during the day. Whenever we can take the train from Wachusett we do. We need a driver to take us and the electric charging stations aren't working there. The commute to Wachusett from Northfield, where we live, is 1hr 15minutes, practically half way to Boston. Every time we drive to Boston, I wish there was a train to take instead. All the Franklin Country trains go to New York - ironic.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Stakeholder Reply

Name: Christine Copeland

Date: 07/07/2023
Response:

It would be helpful if you gave the study website a link here (for the older generation...)

MassDOT Response
Date: 07/11/2023
Response:

Thank you for your comment. The study website is linked here: https://www.mass.gov/northern-tier-passenger-rail-study.

Comment 89
Name: Alex MacIsaac
Date: 07/10/2023
Response Requested: Do not send me a response
Comment:

I think building a railway connecting North Adams to Greenfield and Boston is extremely important to reducing carbon emissions from cars in Massachusetts and would make transportation between different parts of Massachusetts much more accessible to disabled people, low income people who can't afford/can barely afford cars, etc. Also good at opening up more work opportunities for people and making western Massachusetts a more appealing tourist spot, if it has a convenient railway that leads to it. East and western Massachusetts feel like separate states, so this would be great at making them feel more connected. I know I would use it all the time.

Comment 90
Name: R Hoyt
Date: 10/07/2023
Response Requested: Respond to me by e-mail
Comment:

Is the proposed service connecting to the existing MBTA service in Fitchburg (aka "Commuter Snail") or continuing to Boston? Will there be express trains also? What is the proposed travel time and frequency? What is the anticipated fare (in 2023 dollars) that will attract and retain passengers? How will the annual deficit between operating costs and fare revenue be funded and for how long? Is the service sustainable to prevent future inevitable fare increases and service reductions? Will there be connecting local transportation services from the stations to places of employment and places of interest? Will there be a station in S. Ashburnham that will connect to the area rail trail system (oh so close).

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Based on feedback received, four additional service plan alternatives were developed and assessed as part of phase two. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Stakeholder Reply

Name:	R H.
Date:	10/30/2023
Response:	

Thank you. I do not find fares or the annual funding of operating costs mentioned.

MassDOT Response

Date:	11/09/2023
Response:	

The Northern Tier Passenger Rail Study is a conceptual planning study assessing rail service alternatives along the North Adams-Greenfield-Boston corridor. At this conceptual level of planning, fares and annual funding of operating costs have not yet been determined. For more information on intercity passenger rail operations and public governance, please see the Massachusetts Intercity Passenger Rail Governance White Paper, available at: https://www.mass.gov/lists/east-west-passenger-rail-study-documents

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Comment 91

Name:	Jack Dunk
Date:	10/13/2023

Response Requested: Respond to me by e-mail
Comment:

Extend the mbta commuter rail Fitchburg line to south ashburnham via the former pan am southern main line

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 92
Name: David Conlon
Date: 10/22/2023
Response Requested: Respond to me by e-mail
Comment:

I am thrilled that the state is looking to add passenger service to Boston, but am disappointed to see just how few stations are being considered. While I understand more stations adds to the time it takes the train to reach the end of the line, adding more stops will increase ridership, especially in the Hilltowns. For instance, request stops could be added in Shelburne Falls and Charlemont. Shelburne Falls is a very popular tourist destination and local residents, such as myself, would much rather take a train to Boston than drive there. Also, Charlemont is a popular destination because of Berkshire East and the various kayaking/tubing/rafting companies. Adding these two request stops would require minimal investment (can be as simple as a low level platform, or a small high level platform like at Greenfield) and would be a great boost to our local economy. Is this something that can be considered by the study?

MassDOT Response

Thank you for your comment. As part of phase one of the alternatives development process, the study team developed two initial service plan alternatives and an evaluation framework. Based on feedback received, four additional service plan alternatives were developed and assessed as part of phase two, which include potential stations beyond those included in the initial alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 93

Name: Gordon Elwood

Date: 10/26/2023

Response Requested: Respond to me by e-mail

Comment:

This would be so incredible. Please do it.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 94

Name: John Anhalt

Date: 10/27/2023

Response Requested: Respond to me by e-mail

Comment:

I support the local service option. I do think the Shelburne Falls stop should be replaced with Charlemont. This would facilitate transit access to Berkshire East ski facility and is more centered between Greenfield and North Adams. Shelburne Falls residents would be no more than 10 miles from either Greenfield or Charlemont both of which are already serviced by bus transit. Also, you may consider presenting data on climate effects of electrification vs diesel vs no train.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 95

Name: Nathan Haugh

Date: 11/03/2023

Response Requested: Respond to me by e-mail
Comment:

Hello, in the most recent information meeting, it was mentioned that the lower investment option would not have much investment in rail and signal upgrades. I strongly suggest not doing this, as the current track conditions are not optimal for freight operations, let alone passenger. Many of the signals are old have faults with interlocking switches often times not throwing properly. The track is also in not ideal condition, seeing as the rail is rated for 25 MPH the entire way from Wachusett to North Adams, barring the slow track between MP 382 and MP 384. The speed rating for this is also just barely acceptable, seeing as trains travelling at track speed very often rock back and forth heavily, at all locations throughout the route. I would urge massDOT to take the higher investment option, as this would not only increase track speeds tremendously, but it's also increase rider comfort and safety.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 96
Name: Mallory Sullivan
Date: 12/07/2023
Response Requested: Do not send me a response
Comment:

As a one-car western Mass household, the Northern Tier Passenger Rail will open up significant career and leisure opportunities for my family. I support Alternatives #2, #3, and #4 because they represent significantly improved transit between Greenfield and Boston. Reliable transportation between these two cities will expand economic opportunity in Western Mass and offer a low-stress and highly desirable commuting option for me into Boston. I’m excited for one of these options to become a reality, especially if it is the electrified service option. I am neutral toward Alternative #5. I oppose Alternatives #1 and #6 because these entail the same or more time to travel between Greenfield and Boston than by car (or driving from Greenfield to Wachusett, then taking the commuter rail to Boston). These options may be costlier for passengers than current options and would require more planning for riders (Alt. #6). I would not use the service if Alternative #6 is implemented.

Comment 97
Name: Stuart Cohen
Date: 12/11/2023
Response Requested: Respond to me by e-mail
Comment:

Considering the availability of empty industrial properties in Gardner and Athol/Orange for development, these two stops should be included.

MassDOT Response

Thank you for your support of including Gardner and Athol as stops in the study alternatives. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 98
Name: Greg Ferland
Date: 12/24/2023
Response Requested: Do not send me a response
Comment:

I am excited at the possibility of Boston and North Adams being connected by passenger rail. It takes around 3 hours to drive the route with normal traffic conditions, so any train service that takes longer than 3 hours will not attract much ridership. The option that minimizes travel time and offers service at an affordable price will be the most successful.

Comment 99
Name: Judd Greenstein
Date: 01/26/2024
Response Requested: Respond to me by e-mail
Comment:

As an arts programmer based in western MA, along the proposed route, this train line would immensely improve our ability to bring artists out to rural communities (many of them located in Boston do not have cars, or easy access to one), and to market our activities to eastern MA residents who might come out for a weekend but not want to deal with traffic. Once the trains are set up, an economy will develop around it. Greenfield needs more hotels but the economics don't justify building them - this would help bolster the case, and help develop a sustainable tourist economy in the region.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 100

Name:	Frank Citino
Date:	01/28/2024
Response Requested:	Respond to me by e-mail
Comment:	

My name is Frank Citino and I live at 248 Locks Pond Rd, Shutesbury, MA 01072. I am interested in seeing if a multi use trail could be folded into the northern tier rail project at least between North Adams and Greenfield? Multi use trails along active rail lines are beginning to see progress. Here are a few articles discussing these advancements. https://www.mass.gov/doc/shared-use-path-planning-primer-0/download https://www.railstotrails.org/build-trails/trail-building-toolbox/basics/rail-with-trail/ https://usa.streetsblog.org/2014/08/18/why-it-makes-sense-to-add-biking-and-walking-routes-along-active-rail-lines If you live in Franklin County, you must drive a good distance to be able to take advantage of a longer multi use trail for exercise. The Canal Side Trail is wonderful, but not very long. A longer trail would greatly enhance the quality of life in Franklin County. I hope this will get some attention. Sincerely, Frank Citino

MassDOT Response

Thank you for your comment. While this study is focused solely on the feasibility of passenger rail service in the corridor, additional elements like the multi-use trail could be studied as part of a separate effort. Any study of the use of the rail right-of-way would need to be agreed upon by the owners. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 101

Name:	Thomas Benavtho
Date:	02/12/2024
Response Requested:	Do not send me a response
Comment:	

Very excited to get rail access along the Fitchburg line all the way out to North Adams! My partner went to college in North Adams and we like traveling there on occasion; a rail connection would make the trip much easier and likely more frequent as well. Because of the largest impacts to ridership and the environment, I hope you move forward with implementing the full overhead electrification.

Comment 102

Name:	Michael Hines
Date:	02/29/2024
Response Requested:	Respond to me by e-mail
Comment:	

It is a brilliant and very important project that should absolutely be completed. It is important to give northern and more rural regions of the state fair access to the Boston area. Additionally, spreading passenger rail service to under served communities will help influence more sustainable modes of transportation to develop out there. Plus, this opens up the possibility of passenger rail service to expand to Vermont and New Hampshire. Perhaps inspiring the Capital Corridor Project! Also, having the Amtrak line running north from Springfield into Vermont allows for the MBTA to finally have a sort of outer transfer opportunity. Instead of having to just go to Boston to get to a line out to a town near you, you have the option to go from on branch to another without ever having to set foot at the hub in Boston.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 103

Name: William Harrington

Date: 03/07/2024

Response Requested: Respond to me by e-mail

Comment:

I would love to see this be electrified (but obviously any service would be a huge step in the right direction). One graphic that might help show the upfront cost/operational cost dynamic would be some sort of graph showing total cost over time (initial jump followed by steady growth) for various alternatives to show their cross-over points. I think you did a great job of stressing the positive economic benefits of ridership. Ridership is king. Also, although this low density line is probably fairly low priority for an investment in overhead electrification, the line's history of electrification combined with the fact that electrification would be done in conjunction with comprehensive track improvements, could give this line might have the lowest electrification cost per mile in the state. As such, it could be an opportunity for MassDOT and local contractors to gain experience and work-out the growing pains of installing overhead electric before ramping up to the much larger and expensive task of electrifying the MBTA commuter lines. A learning experience might be an effective way to sell this to the legislature.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 104

Name: Eric Buddington

Date: 03/22/2024

Response Requested: Do not send me a response

Comment:

Thank you for posting the meeting videos online. I support the plan for electrified service. Along with the environmental benefits, electric trains produce far less noise. Using them here will build the equipment and expertise to better electrify other lines in the future. One concern: many of my Amtrak trips have been delayed due to contention with freight trains. This is not a problem where Amtrak owns the rails. In Albany, they run at more than 100 miles per hour with no freight contention. The state should take ownership of the tracks to ensure control over operations.

Comment 105

Name:	Harry Wilson
Date:	03/23/2024
Response Requested:	Respond to me by e-mail
Comment:	

I support the expansion of railroad service from Boston to North Adams

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 106

Name:	John Wallace
Date:	03/25/2024
Response Requested:	Respond to me by e-mail
Comment:	

This is a much needed project. Any project that eliminates peoples need to reply on cars is worthwhile

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 107
Name: Virginia Grant
Date: 03/25/2024
Response Requested: Respond to me by e-mail
Comment: I will be attending the zoom meeting but I also wanted to leave a comment I live in North Adams and I would use this rail service all the time as it is now I travel to Fitchburg now to catch the train. So please I would even be happy with the train service being in Florida ma before the hossac tunnel or shelburne falls. Even Charlemont

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Stakeholder Reply
Name: Virginia G.
Date: 04/08/2024
Response:

I have thank you

Comment 108
Name: Dorothy Mclver
Date: 03/25/2024
Response Requested: Respond to me by e-mail
Comment:

I cannot attend the meeting but I support having passenger rail altong th Northern tier corrider of W. MA. I want to be able to take a train to Boston to visit and also so I can connect with rail service to Maine. The train station in my hometown in So. Maine has been operational for awhile now but getting to Boston to hook up with the train is challenging. Whhen I tried I found the bus got into the bus station in the middle of the night and I would have to get a cab to the trian station to catch the morning train then or later, but either way stay awake all night or sleep in a transit staiton which as an women in my late 70's is not something I want to do. yet too late (and expensive) to stay in a hotel anywhere for just a few hours. And many people would like to be ablet o take the train to Boston (and to Maine as well I expect). We need this. Thank you for working to make this happen. Dorothy McIver

MassDOT Jun 2024

Greenfeild, MA

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 109

Name: Rauley Caine

Date: 03/25/2024

Response Requested: Respond to me by e-mail

Comment:

Given the high cost for full electrification of the line, and its dismissal as a serious option by project planners, please instead consider using hydrogen H2-powered fuel cell zero emission multiple unit electric trains, such as the Siemens Mireo Plus H or the Stadler Flirt H2 (which can already be produced in the USA in Utah). Use of these zero emission Hydrogen-powered multiple units should be prioritized over conventional (and most likely second-hand) Amtrak diesel locomotives and aging push-pull Amfleet I/II coaches. Stadler Flirt H2 trains will soon be operated in revenue service in California on the San Bernardino County's Redlands Commuter service. Twenty-nine (29) more Stadler Flirt H2 trainsets have also been ordered by Amtrak California (September 2022), proving that these vehicles use trusted technology. Currently, the Stadler Flirt H2 ZEMU (zero emission multiple unit) has a publicized operating range of about 250 miles-- ample range for a trip between Boston and North Adams. More likely, the trainset could be refueled at the North Adams depot quickly between trips with the publicized refueling time to be about 30 minutes. Given the modest ridership estimations for this corridor, using smaller ZEMU, such as the Stadler Flirt H2 with a seated capacity of 108 passengers, and a top speed of 79 miles per hour, makes sense for a regional line of this kind. Combined with a ZEMU's superior acceleration and deceleration statistics versus a standard conventional diesel push-pull consist, the choice for using a ZEMU powered by Hydrogen becomes self-evident. To put it plainly: using a hydrogen powered zero-emission train will be a more practical than installing overhead catenary on the entire corridor and more environmentally suitable to our area than defaulting to the use of aging push-pull locomotives with only one (or two) fifty year old Amfleet cars trailing behind. Hydrogen fuel cell vehicles are zero-emission, have better range than their battery electric train counterparts, and can be quickly refueled at a depot with only minor investment to infrastructure. The Berkshire RTA is already looking to covert its buses to H2; a shared Depot in North Adams with a Hydrogen electrolyzer (a device that creates usable hydrogen from electricity and water) could provide synergy towards this project to becoming zero emissions as well as the Berkshire RTA's existing goals for zero-emissions public transit. Financial investment in H2 vehicles from the start will be a wiser investment than installing overhead catenary along the entire line (both immediately and when factoring in lifetime investment for ongoing maintenance). Investing in H2-powered ZEMU train sets will provide zero emission travel more efficiently than installing overhead catenary along the entire corridor, and will certainly more environmentally practical than either battery-electric trains or conventional push-pull diesel trainsets.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 110

Name:	Sue Sullivan
Date:	03/26/2024
Response Requested:	Respond to me by e-mail
Comment:	

I am in full support of evaluating and adding to rail lines in western mass. I have taken Amtrak several times to NYC and NJ and love it. If we had a local train from Turners Fallss down to Northapton and Holyoke that would be amazing!

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 111

Name:	Riley Mullany
Date:	03/26/2024

Response Requested: Do not send me a response

Comment:

I strongly support the restoration of Northern Tier Passenger Rail, especially the stops in Shelburne Falls, Greenfield and North Adams. As a folk musician and artist living in Boston, having reliable transit to and from these cities would greatly improve my life and livelihood. Weekend service in particular would be very helpful for me particularly Thank you for your time. Riley

Comment 112

Name: Cole Raineyslavick

Date: 03/27/2024

Response Requested: Respond to me by e-mail

Comment:

Hello, Please Combine Alternatives 3 and 4. The stop penalty on electrified rail is lower so it could add those two stops with minimal increases in service times. Sincerely, Cole Rainey-Slavick

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 113

Name: Martha Hanner

Date: 03/29/2024

Response Requested: Do not send me a response

Comment:

Very interesting presentation tonight, 3-28-24 . I definitely favor Option #4. If one is going to the expense of creating the service, there should be stops at 2,3, or 4 additional places along the way, including Gardner and Athol, in order to service the northern part of Western Mass. population effectively. Extension to Albany is lower priority and can wait: Nothing should be constructed in a manner that would exclude an Albany extension in the future. #5 Electrified service might be considered ideal, to lower emissions, but I fear the high cost would mean it's never going to be built. #3 Having to change to the MBTA at Fitchburg seems like a big hassle that would add &gt; 1/2 hour travel time and would probably discourage ridership. #6 The beneficial economic development and potential population growth in the area to be served should definitely be factored into the analysis, as emphasized by a few of the Q&amp;A speakers tonight. I agree with those who emphasized that the tickets will have to be priced attractively to encourage ridership. No one mentioned the ability to just sit and get some work done on the train instead of driving. Much more efficient use of one's time! I look forward to the future rail service! I'm no longer willing to drive to Boston from Amherst and would love to have train service to go visit for the day or weekend.

Comment 114

Name:	john Leblanc
Date:	03/29/2024
Response Requested:	Respond to me by e-mail
Comment:	

The only impact this project will have is making well connected "consultants" very rich. There is no call nor need for this project unless you can prove that every train will be self supporting with zero government funding. This just another attempt to extend the failure of the MBTA past the 128 beltway.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven’t already.

Comment 115

Name:	Claire Chang
Date:	03/31/2024
Response Requested:	Respond to me by e-mail

Comment: I was not able to provide comments during the public hearing last week. please accept these comments. I appreciate the broad alternatives researched and described in much detail. I think that due to climate change and the need to electrify transportation on all levels as soon as possible that any choice for passenger rail must be electrified rail. even with the greater cost. we will need to electrify and not add to the fossil fuel GHG emissions for the Commonwealth to be able to meet 2030 or 2050 goals. I would like to see what the costs are for the different routes and stops if trains were electric. I think that if it is possible to design for the best, comprehensive electric passenger rail service, then implement in phases from Fitchburg west. maybe Fitchburg to greenfield. then add greenfield to pittsfield. then add pittsfield west as a final possible addition given funding and other resources. I would certainly take advantage of a station in Greenfield on electric trains to Fitchburg or boston north or south station. the shorter duration of travel would be best. but again as an intermediary solution. transferring to commuter rail could work. maybe a commuter express train to porter sq or north station? Greenfield has amble EV charging stations located close to the train station. but other stops would need to add EV charging stations level 2 for commuters. thank you for your consideration. I look forward to progress on an electric passenger rail for the Northern Tier.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 116

Name:	Jonathan Myers
Date:	04/05/2024
Response Requested:	Respond to me by e-mail
Comment:	

Thank you for the hearing on the Northern Tier Rail. To be able to access Boston and Albany-Rennselaer from North Adams would be a real game changer for all of Berkshire County.

MassDOT Response

Thank you for your comment. Please visit the study website for additional information or to sign up for updates as the study progresses, if you haven't already.

Comment 117

Name:	Gordon Squire
Date:	04/05/2024
Response Requested:	Do not send me a response
Comment:	

I listened to a program on a proposed northern rail line to North Adams and have a number of objections. At present during times of the year there is no weekday public transportation between Berkshire County and Metro Boston other than the daily Amtrack which is frequently way behind schedule coming east. For the limited numbers and dispersed destinations of those passengers the present Mass Pike is more than adequate for the short distance from Springfield by bus especially if more frequent. There is adequate public transportation from Pittsfield to North County. Transportation funding could better be allocated elsewhere.

Comment 118

Name:	Michael Hines
Date:	04/29/2024
Response Requested:	Respond to me by e-mail
Comment:	

do it do it do it do it do it do it do it do it do it do it do it do it do it PLEASE

Comment 119

Name:	Jackson Hotaling
Date:	05/30/2024
Response Requested:	Do not send me a response
Comment:	

Please establish passenger rail along the Northern Tier Corridor of western Massachusetts. I do not own a car and visit family in Massachusetts and several neighboring states in New England; this would be a welcome option for traveling to see them.

Comment 120

Name: Jackson Hotaling
Date: 05/30/2024
Response Requested: Do not send me a response
Comment:

Please establish this corridor. I submitted a previous comment, however I had issues with the mobile version of this survey and could not mark 'In favor'. I am trying again.

Comment 121

Name: Joel Pattison
Date: 06/12/2024
Response Requested: Respond to me by e-mail
Comment:

I fully support the creation of a passenger rail alternative in the northern tier corridor. As a new resident of Williamstown, the lack of easy public transit options costs me hours in the car on small roads, and makes a journey to the Eastern part of the state up to a three-hour drive, on top of finding parking. If a passenger rail service existed linking Williamstown or North Adams with the East, I would plan to spend much more time and money in Massachusetts, as opposed to New York and Vermont. It would relieve pressure on the already tight housing market in the northwestern corner of the state and make it possible to consider living somewhere further away and commuting. At present, the car dependency of the Berkshires is one of the reasons I am considering moving elsewhere. If possible, I would like to know what the possible time frame for such an investment in rail infrastructure might be.

MassDOT Response

Thank you for your comment. Draft recommended next steps and a draft implementation plan, including a sample implementation timeline, were presented at the public meeting held in March. Please visit the study website to review the presentation or to sign up for updates as the study progresses, if you haven't already.

Appendix B

Federal Railroad Administration Grade Crossing Inventory

Crossing ID	Milepost	Municipality	Street	Highway Type	Number of Tracks	Warning Type	Quiet Zone
970951C	0.83	SOMERVILLE	BET FL Ped East	Pedestrian	2	Passive	
970952J	0.87	SOMERVILLE	BET FL Ped Ctr	Pedestrian	2	Passive	
921763E	1.03	SOMERVILLE	Yard 14 Crossing	Private	2	Active	
052304J	2.68	SOMERVILLE	Park Street	Local	2	Active	Yes
052313H	4.16	CAMBRIDGE	Sherman Street	Local	2	Active	Yes
052315W	5.56	BELMONT	Brighton Street	Local	2	Active	Yes
970894R	6.39	BELMONT	Belmont MW	Private	2	Passive	
052321A	8.35	WALTHAM	Beaver Street	Local	2	Active	Yes
052325C	9.84	WALTHAM	Elm Street	Local	1	Active	Yes
052326J	9.95	WALTHAM	Moody Street	Local	1	Active	Yes
970896E	11.31	WALTHAM	Brandeis East	Pedestrian	2	Passive	
970897L	11.45	WALTHAM	Brandeis West	Pedestrian	2	Passive	
052328X	11.49	WALTHAM	South Street	Local	2	Active	Yes
052332M	13.18	WESTON	Church Street	Local	2	Active	Yes
970898T	13.21	WESTON	Kendall Green Platform	Pedestrian	2	Passive	
052334B	13.77	WESTON	Viles Street	Local	2	Active	Yes
052335H	14.34	WESTON	Conant Road	Local	2	Active	Yes
052337W	15.59	LINCOLN	Tower Road	Local	2	Active	Yes
052338D	15.97	LINCOLN	Old Sudbury Road	Local	2	Active	Yes
052339K	16.01	LINCOLN	South Great Road	State	2	Active	Yes
970899A	16.63	LINCOLN	Lincoln Station IB East	Pedestrian	2	Passive	
970900S	16.65	LINCOLN	Lincoln Station IB West	Pedestrian	2	Passive	
052340E	16.71	LINCOLN	Lincoln Road	Local	2	Active	Yes
052344G	20.00	CONCORD	Sudbury Road	Local	2	Active	Yes
970901Y	20.08	CONCORD	Concord Station East	Pedestrian	2	Passive	
970902F	20.09	CONCORD	Concord Station Center	Pedestrian	2	Passive	
970903M	20.11	CONCORD	Concord Station West	Pedestrian	2	Passive	
052345N	20.16	CONCORD	Belknap Street	Local	2	Active	Yes
052348J	21.60	CONCORD	Baker Street	Local	2	Active	Yes
977284G	21.90	CONCORD	Bruce Freeman Trail	Pedestrian	2	Active	
970904U	21.92	CONCORD	W Concord Pedestrian East	Pedestrian	2	Passive	
970958A	21.96	CONCORD	W Concord Pedestrian West	Pedestrian	2	Passive	
052349R	22.00	CONCORD	Commonwealth Avenue	Local	2	Active	Yes
052350K	22.48	CONCORD	Conant Street	Local	2	Active	Yes
052352Y	24.13	ACTON	Parker Street	Local	2	Active	Yes

Crossing ID	Milepost	Municipality	Street	Highway Type	Number of Tracks	Warning Type	Quiet Zone
052354M	25.54	ACTON	Martin Street	Local	2	Active	Yes
052355U	26.02	ACTON	Central Street East	Local	2	Active	Yes
052356B	26.80	ACTON	Massachusetts Avenue	State	2	Active	Yes
052357H	26.84	ACTON	Arlington Street	Local	2	Active	Yes
052358P	27.30	ACTON	Central Street West	Local	2	Active	Yes
052360R	28.15	BOXBOROUGH	Sargent Street	Local	2	Active	
052361X	28.94	BOXBOROUGH	Depot Road	Local	2	Active	
052363L	30.10	LITTLETON	Foster Street	Local	2	Active	
052366G	31.50	LITTLETON	King Street	Local	2	Active	
052368V	33.50	AYER	Willows Road	Local	2	Active	
052369C	34.50	AYER	Snake Hill Road	Local	2	Active	Yes
052370W	34.95	AYER	Sandy Pond Road	Local	2	Active	
052371D	35.50	AYER	Groton-Harvard Road	Local	2	Active	
970905B	36.04	AYER	Ayer Station East	Pedestrian	2	Passive	
970906H	36.07	AYER	Ayer Station West	Pedestrian	3	Passive	
970907P	36.11	AYER	Ayer Tower	Pedestrian	3	Passive	
052377U	37.50	SHIRLEY	Walker Road	Local	2	Active	
052378B	38.00	SHIRLEY	Patterson Road	Local	2	Active	
052380C	39.30	SHIRLEY	Phoenix Street	Local	2	Active	
052381J	39.46	SHIRLEY	Main Street	Local	2	Active	
052382R	39.59	SHIRLEY	Center Road	Local	2	Active	
052383X	40.16	SHIRLEY	Catacunemaug Road	Local	2	Active	
970908W	45.23	LEOMINSTER	North Leominster Station	Pedestrian	2	Passive	
052425G	75.20	ROYALSTON	Baldwinville Road	State	2	Active	
052435M	85.97	ORANGE	Mill St East	Local	1	Active	
052436U	86.13	ORANGE	Mill St West	Local	1	Active	
052437B	86.35	ORANGE	Water Street	Local	1	Active	
052443E	90.74	ERVING	Waste Treatment	Local	2	Active	
052445T	93.54	WENDELL	Farley Road	Local	2	Active	
052448N	99.54	MONTAGUE	Lake Pleasant Road	Local	2	Active	
052470B	109.70	DEERFIELD	Chapman Road	Private	1	Passive	
052472P	113.67	CONWAY	Bardwells Ferry Road	Local	1	Active	
052473W	116.10	CONWAY	Power Co. Access Road	Private	1	Passive	
052474D	118.07	BUCKLAND	South Conway Road	Local	1	Active	
052475K	118.44	BUCKLAND	Elm Street	Local	2	Active	
052476S	118.73	BUCKLAND	Ashfield Street	Local	2	Active	
052483C	128.92	CHARLEMONT	Tower Road	Local	2	Active	

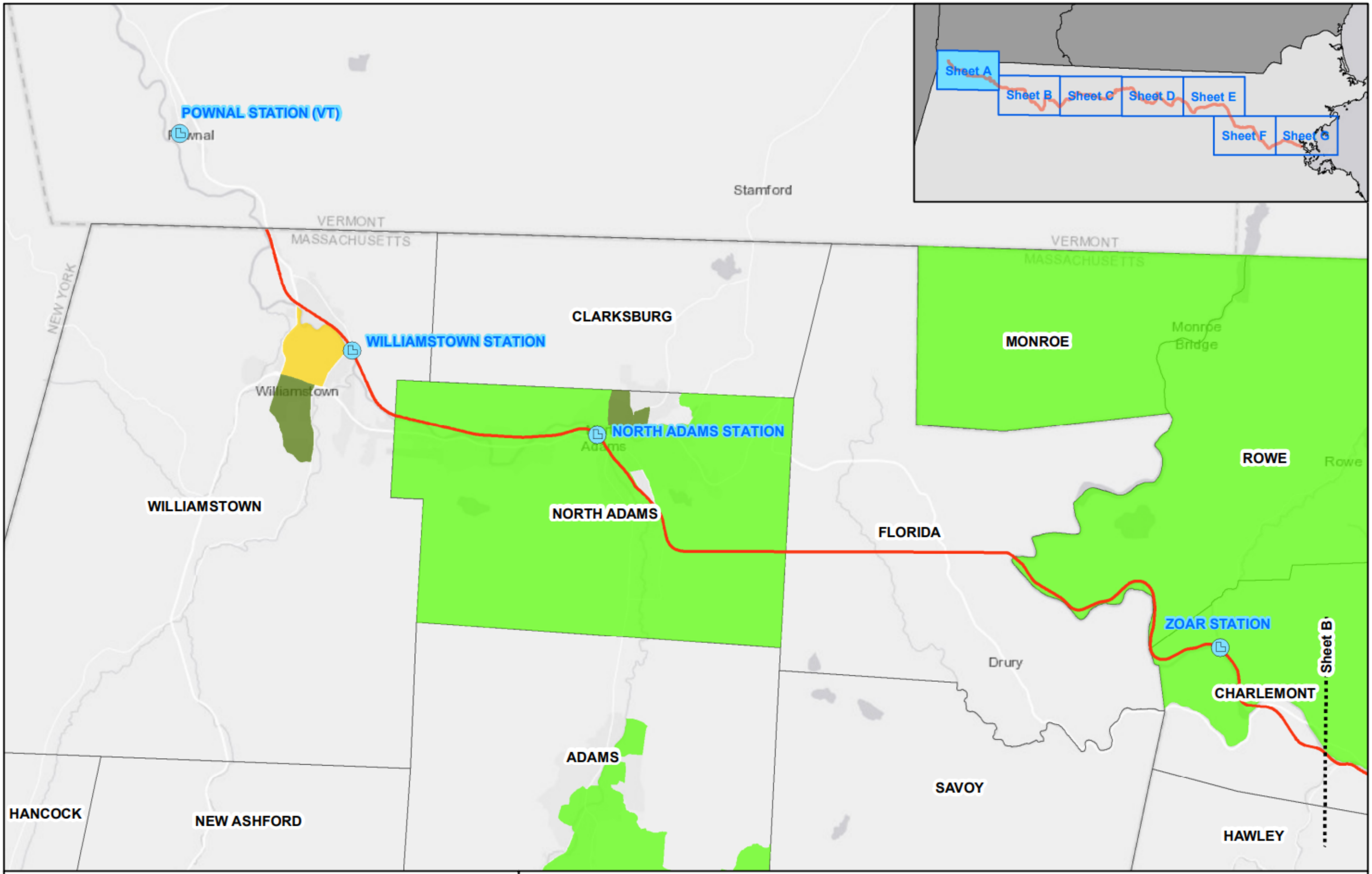
Crossing ID	Milepost	Municipality	Street	Highway Type	Number of Tracks	Warning Type	Quiet Zone
052486X	135.00	CHARLEMONT	Tunnel Road	Local	2	Passive	
052487E	135.65	FLORIDA	River Road	Local	1	Active	
052497K	144.50	NORTH ADAMS	Protection Ave.	Local	1	Active	
052499Y	144.95	NORTH ADAMS	Sewage Plant	Private	1	Passive	
052500R	145.44	NORTH ADAMS	Ashton Ave.	Local	1	Active	
052504T	148.27	WILLIAMSTOWN	Moores Crossing	Private	1	Active	

massDOT
Massachusetts Department of Transportation

Appendix C

Environmental Resource Maps

Environmental Justice Communities
Environmental Resources
FEMA Floodplain
Historic Properties
Protected Open Space
Wetland Resource Areas



Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet A

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Rail Station

OTS Northern Tier Railline

Town Boundary

2020 Environmental Justice Communities

EJ Criteria

🟨	Minority
🟩	Income
🟦	Englilsh isolation
🟫	Minority and Income
🟪	Minority and English isolation
🟦	Income and English isolation
🟪	Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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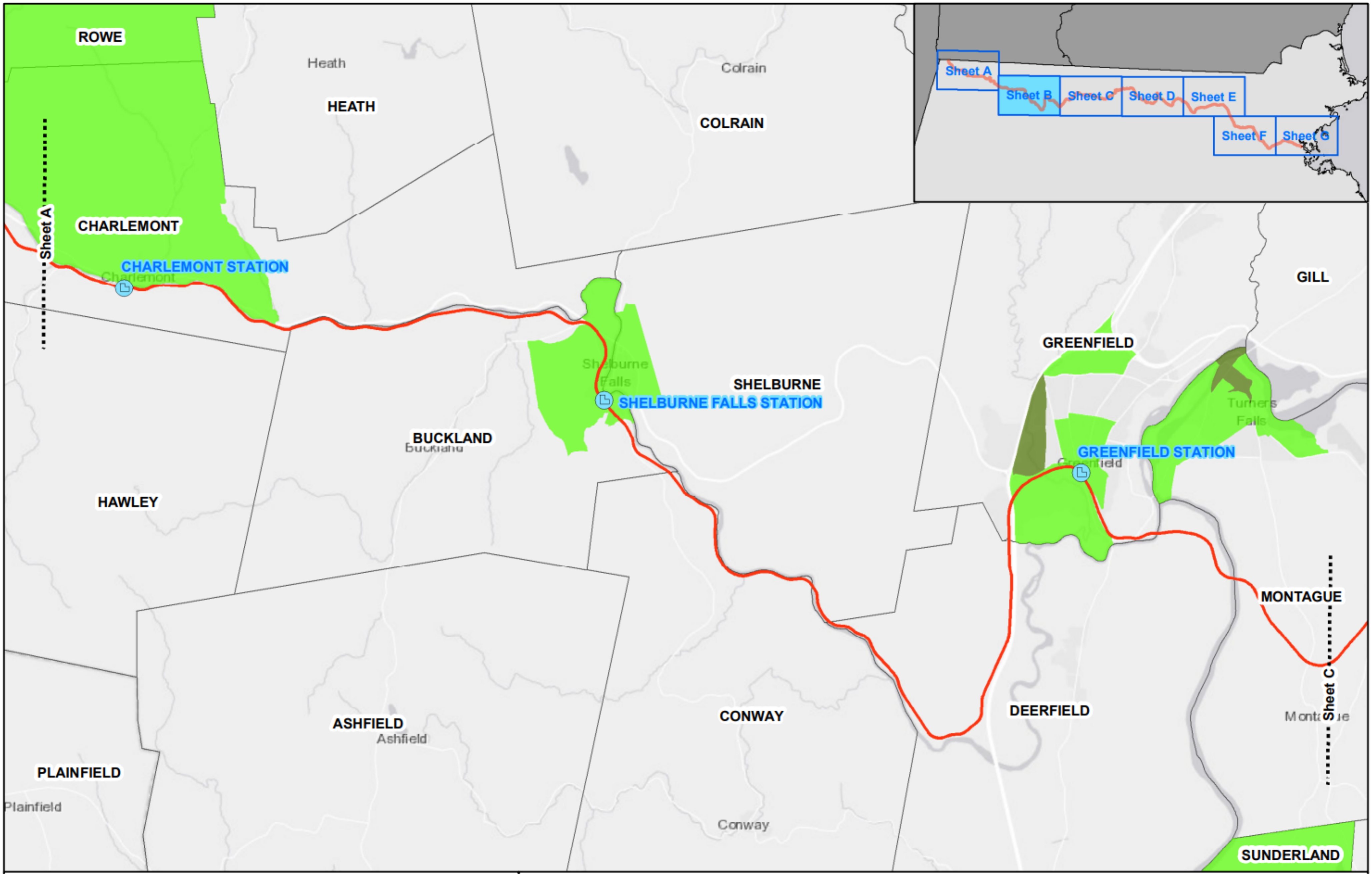

Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet B

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓑ Rail Station

— OTS Northern Tier Railline

☐ Town Boundary

2020 Environmental Justice Communities

EJ Criteria

🟨 Minority

🟩 Income

🟦 Engllish isolation

🟫 Minority and Income

🟪 Minority and English isolation

🟦 Income and English isolation

🟪 Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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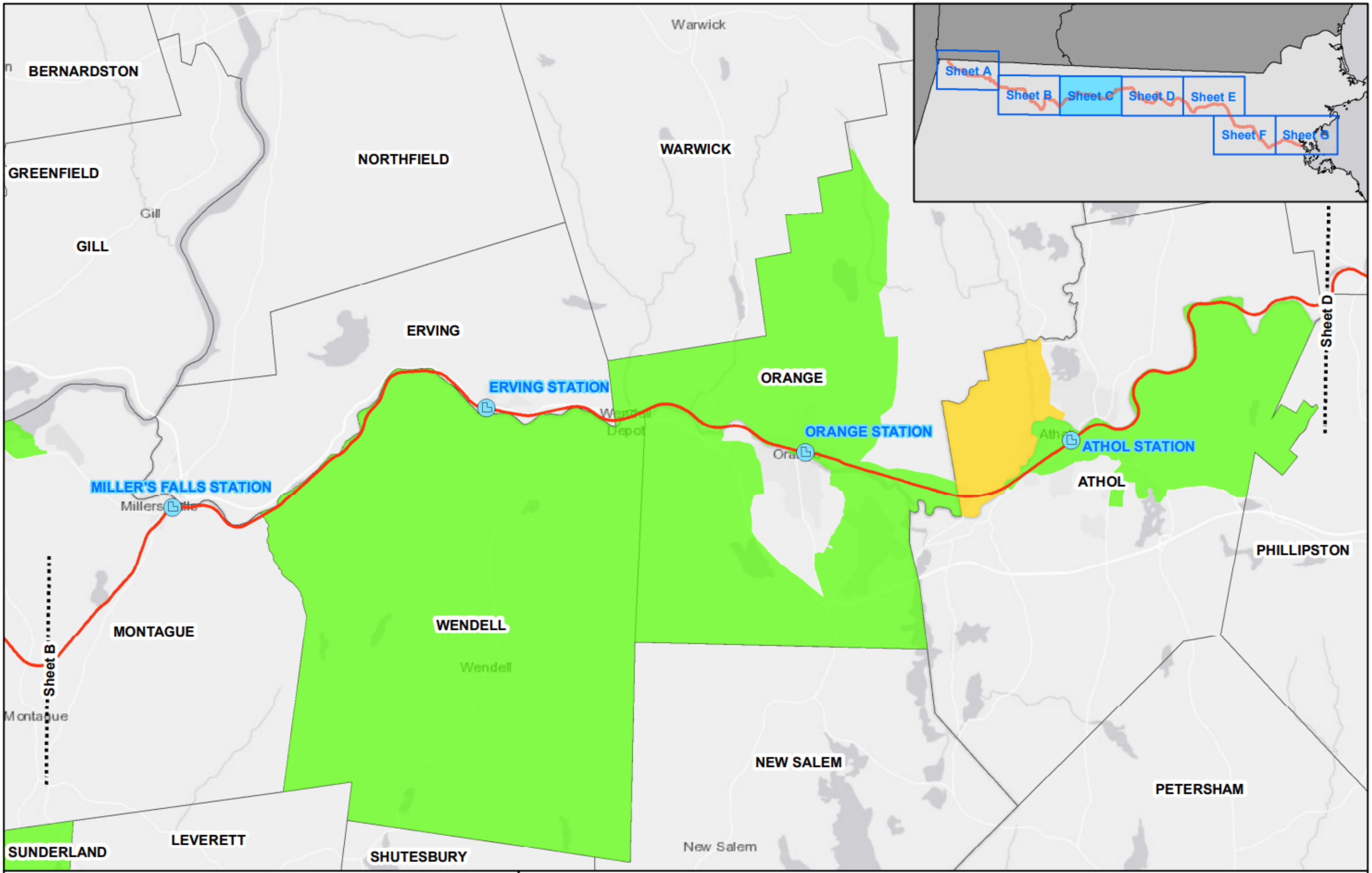

Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet C

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

◎ Rail Station

— OTS Northern Tier Railline

☐ Town Boundary

2020 Environmental Justice Communities

EJ Criteria

🟨 Minority

🟩 Income

🟦 Engllish isolation

🟫 Minority and Income

🟪 Minority and English isolation

🟦 Income and English isolation

🟪 Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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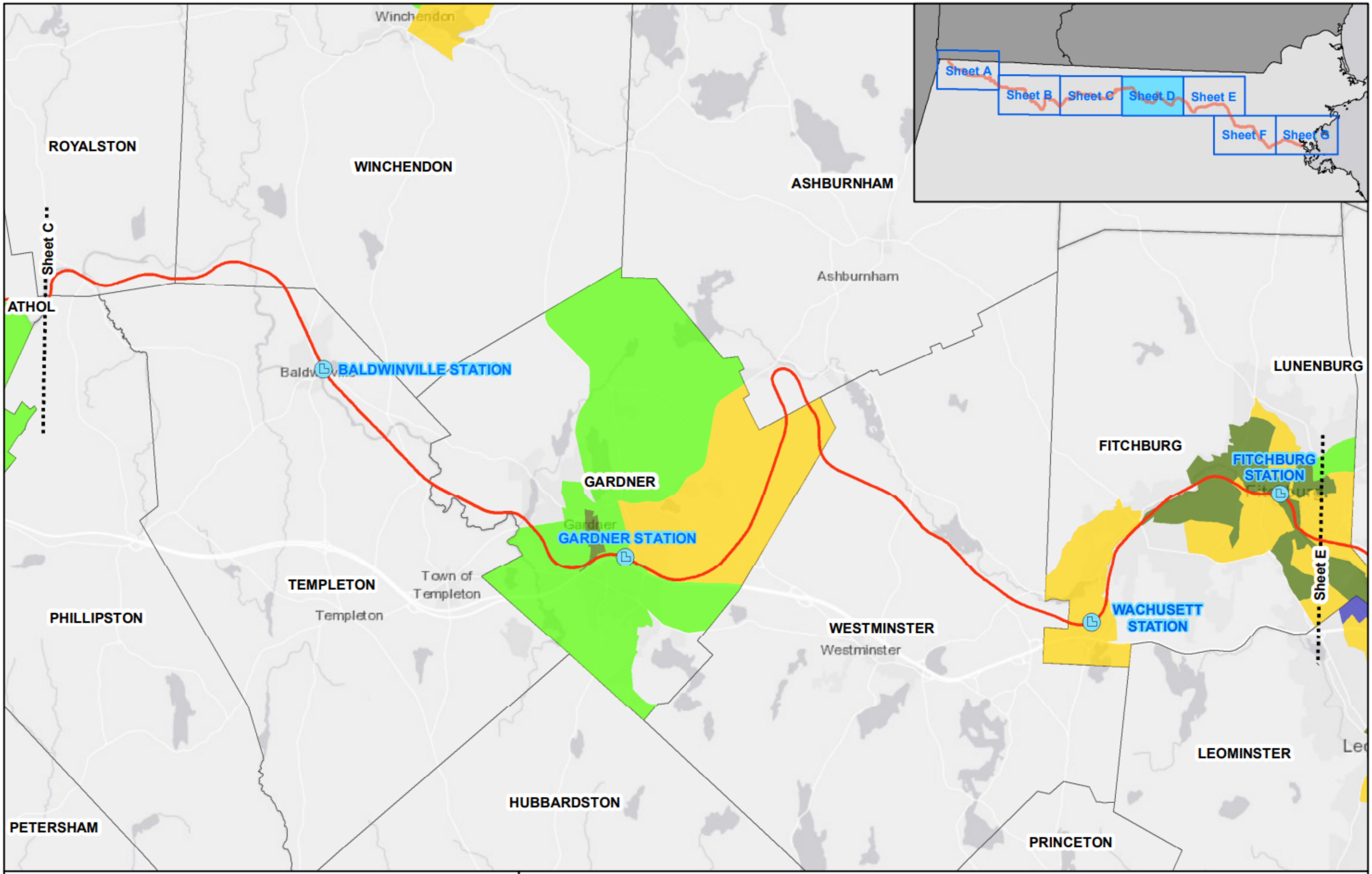

Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet D

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Rail Station

OTS Northern Tier Railline

☐ Town Boundary

2020 Environmental Justice Communities

EJ Criteria

🟨 Minority

🟩 Income

🟦 Engllish isolation

🟩 Minority and Income

🟪 Minority and English isolation

🟦 Income and English isolation

🟪 Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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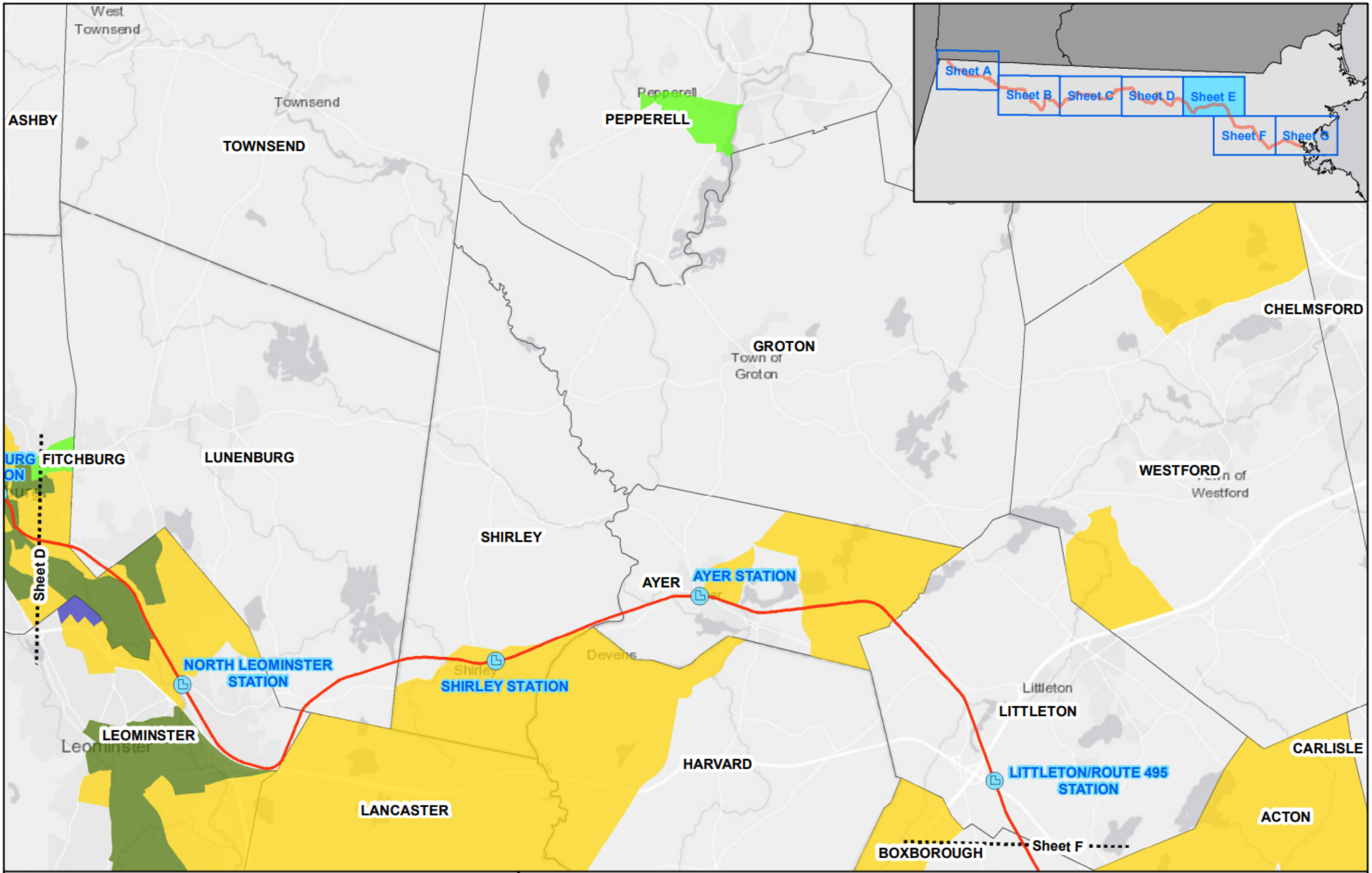

Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet E

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Rail Station
- OTS Northern Tier Railline
- ☐ Town Boundary

2020 Environmental Justice Communities

EJ Criteria

- 🟨 Minority
- 🟩 Income
- 🟦 Engllish isolation
- 🟩 Minority and Income
- 🟪 Minority and English isolation
- 🟦 Income and English isolation
- 🟪 Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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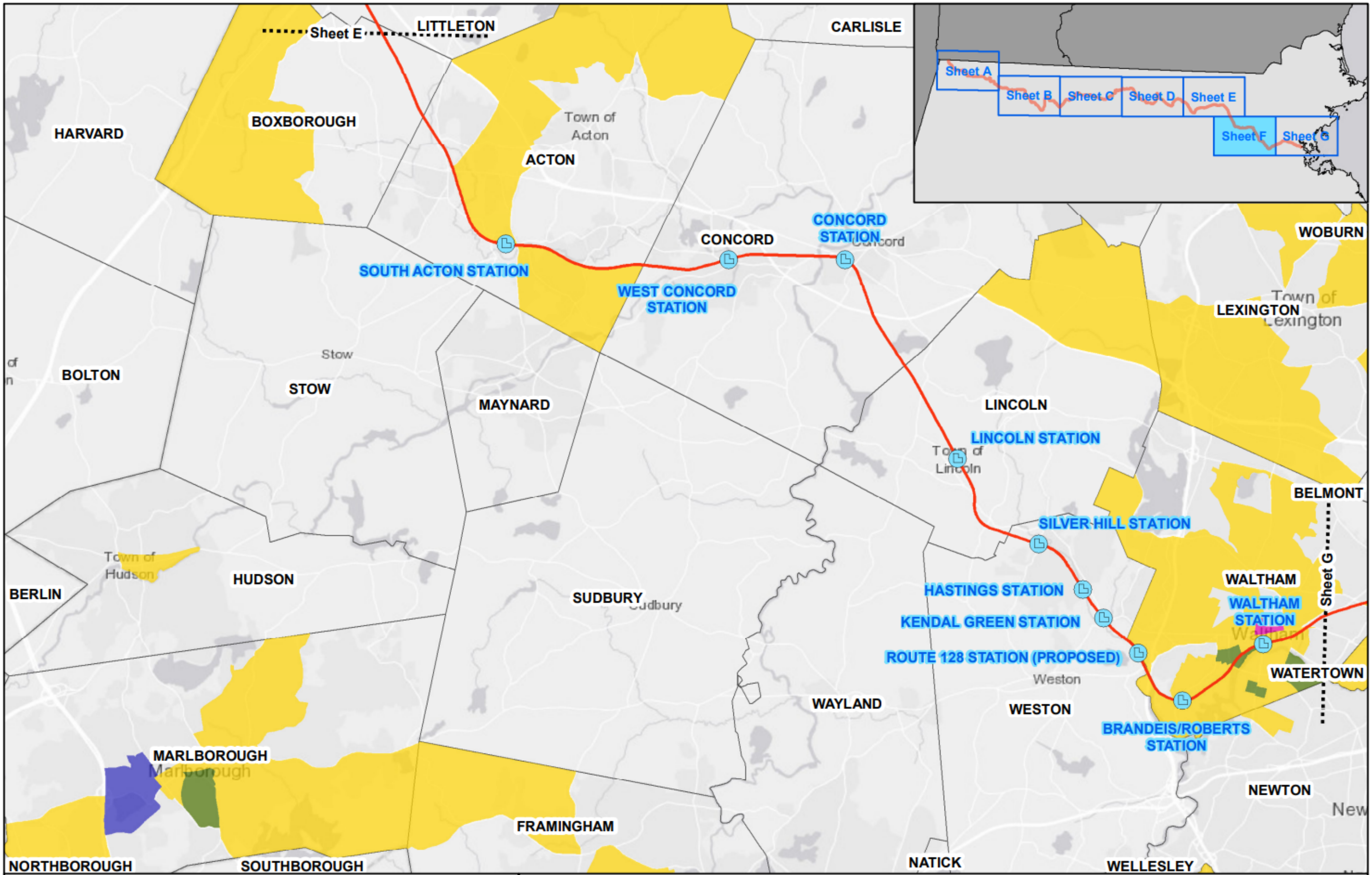

Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet F

Boston, MA

March 2022

Legend

- Rail Station
- OTS Northern Tier Railline
- ☐ Town Boundary

2020 Environmental Justice Communities

EJ Criteria

- 🟨 Minority
- 🟩 Income
- 🟦 Engllish isolation
- 🟩 Minority and Income
- 🟪 Minority and English isolation
- 🟦 Income and English isolation
- 🟪 Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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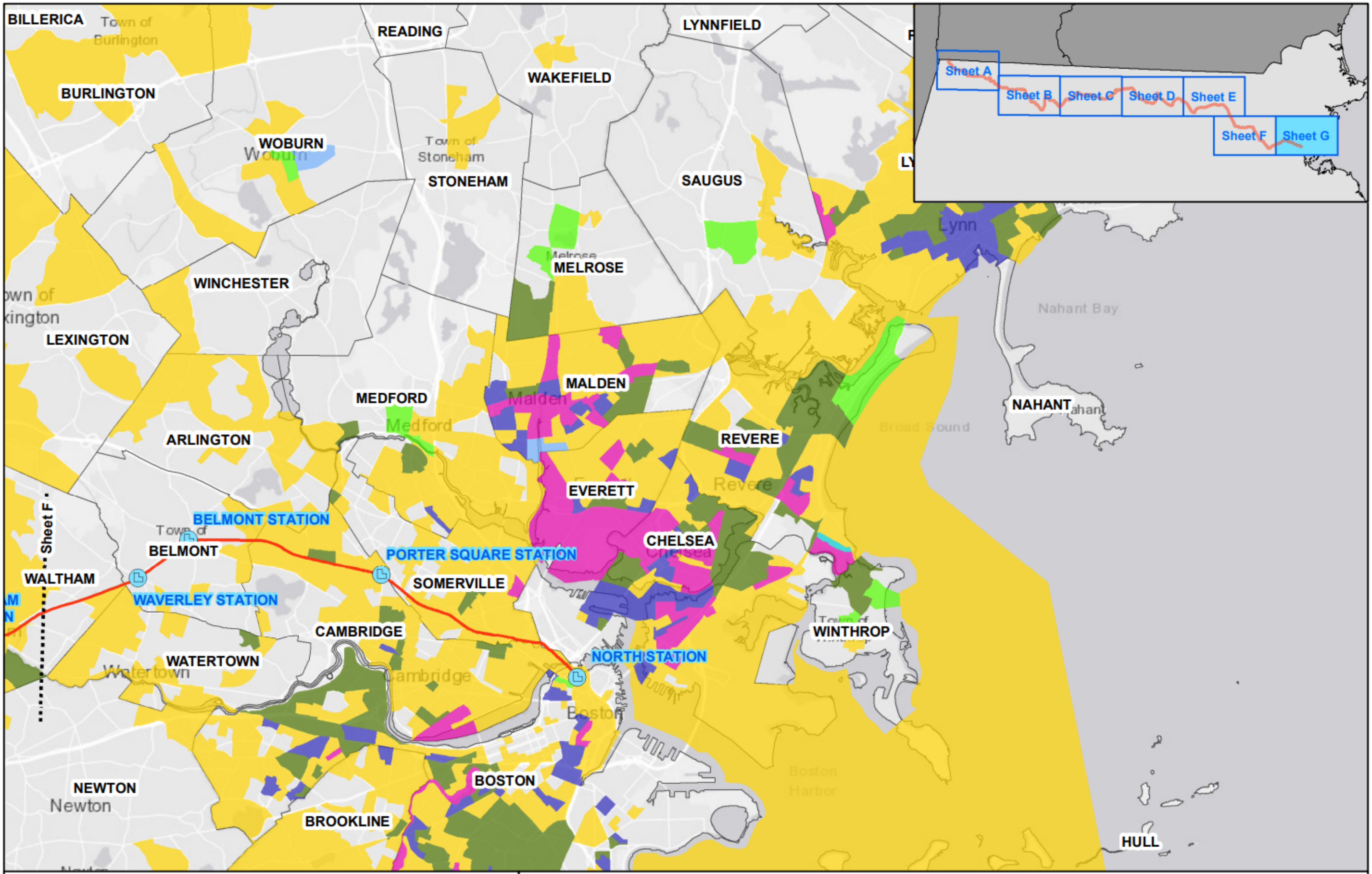

Environmental Justice Communities

MassDOT Northern Tier Passenger Rail Study

Figure 1

Sheet G

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓛ Rail Station

— OTS Northern Tier Railline

☐ Town Boundary

2020 Environmental Justice Communities

EJ Criteria

🟨 Minority

🟩 Income

🟦 Engllish isolation

■ Minority and Income

■ Minority and English isolation

■ Income and English isolation

■ Minority, Income and English isolation

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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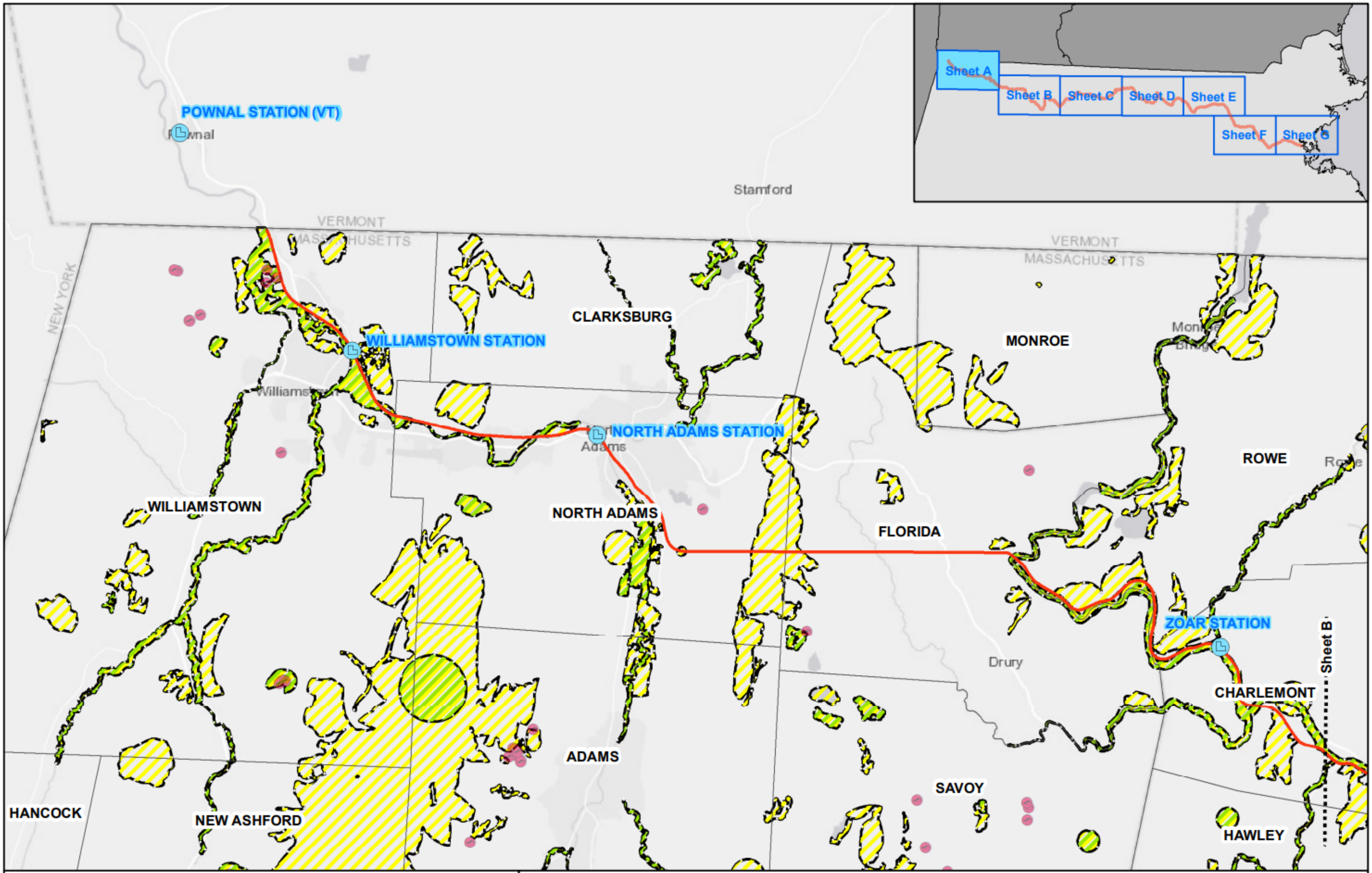

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet A

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- ● Certified Vernal Pool
- Rail Station
- — Chapter 91 Jurisdiction
- — OTS Northern Tier Railline
- ☐ Town Boundary
- ▨ NHESP Estimated Habitat
- ▨ NHESP Priority Habitat
- 🟪 Outstanding Resource Water
- 🟧 Areas of Critical Environmental Concern

0 1 2 3 4 5 Miles

N

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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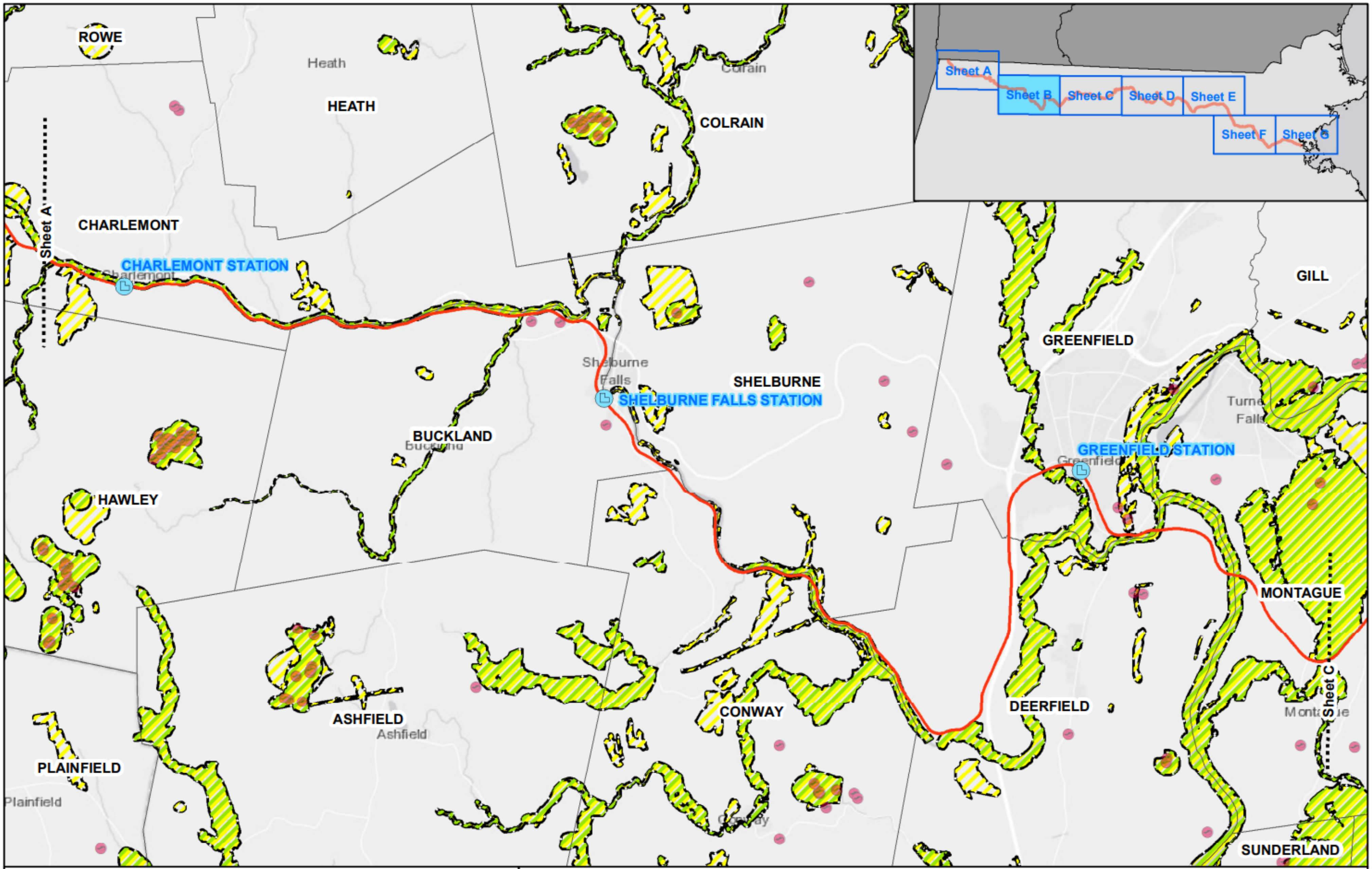

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet B

HNTB massDOT
Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

● Certified Vernal Pool

Ⓛ Rail Station

— Chapter 91 Jurisdiction

— OTS Northern Tier Railline

☐ Town Boundary

▨ NHESP Estimated Habitat

▨ NHESP Priority Habitat

■ Outstanding Resource Water

■ Areas of Critical Environmental Concern

N

0 1 2 3 4 5 Miles

Note:
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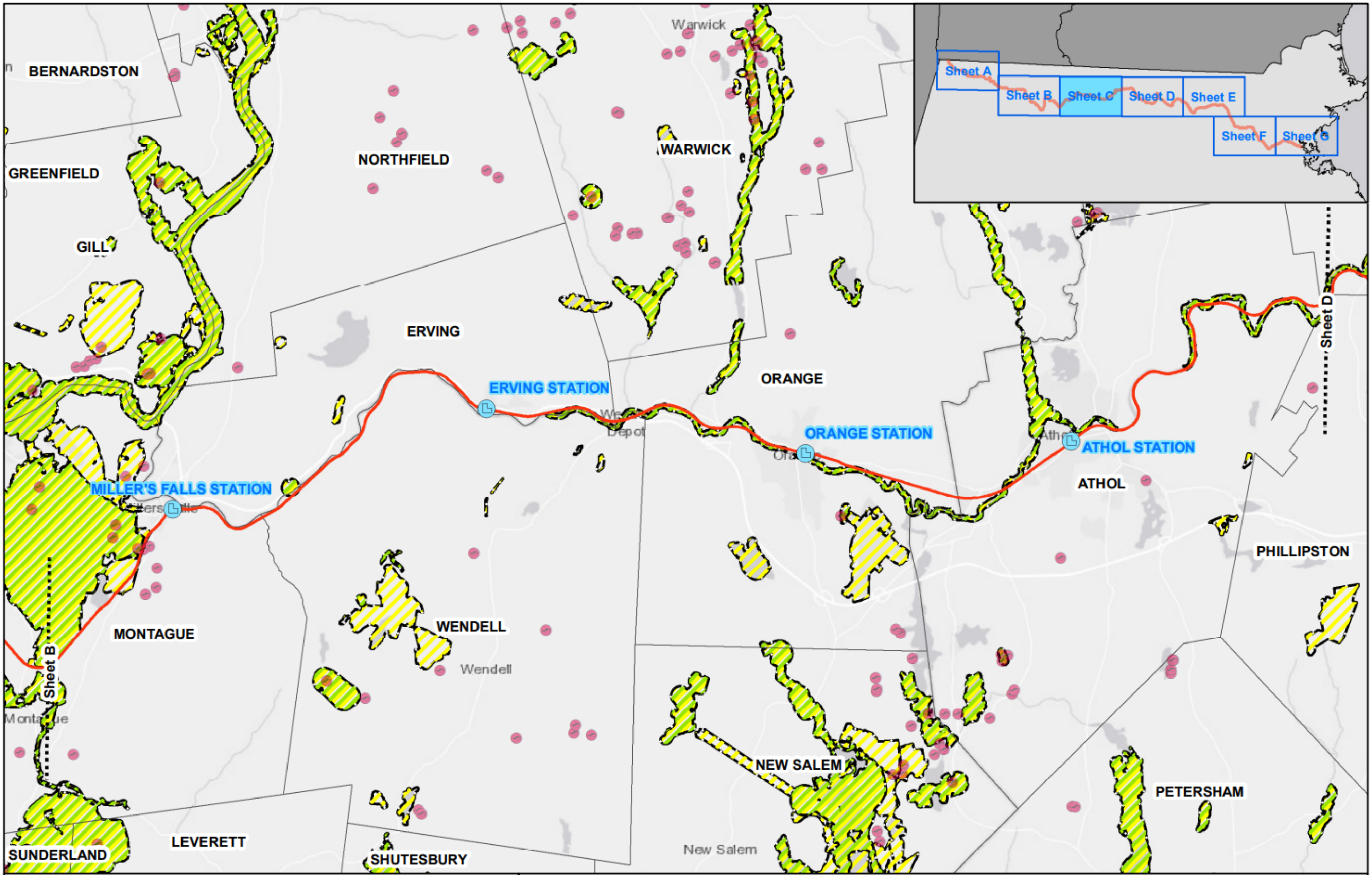

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet C

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- ● Certified Vernal Pool
- Ⓢ Rail Station
- — Chapter 91 Jurisdiction
- — OTS Northern Tier Railline
- ☐ Town Boundary
- ▨ NHESP Estimated Habitat
- ▨ NHESP Priority Habitat
- 🟪 Outstanding Resource Water
- 🟧 Areas of Critical Environmental Concern

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

0 1 2 3 4 5 Miles

N

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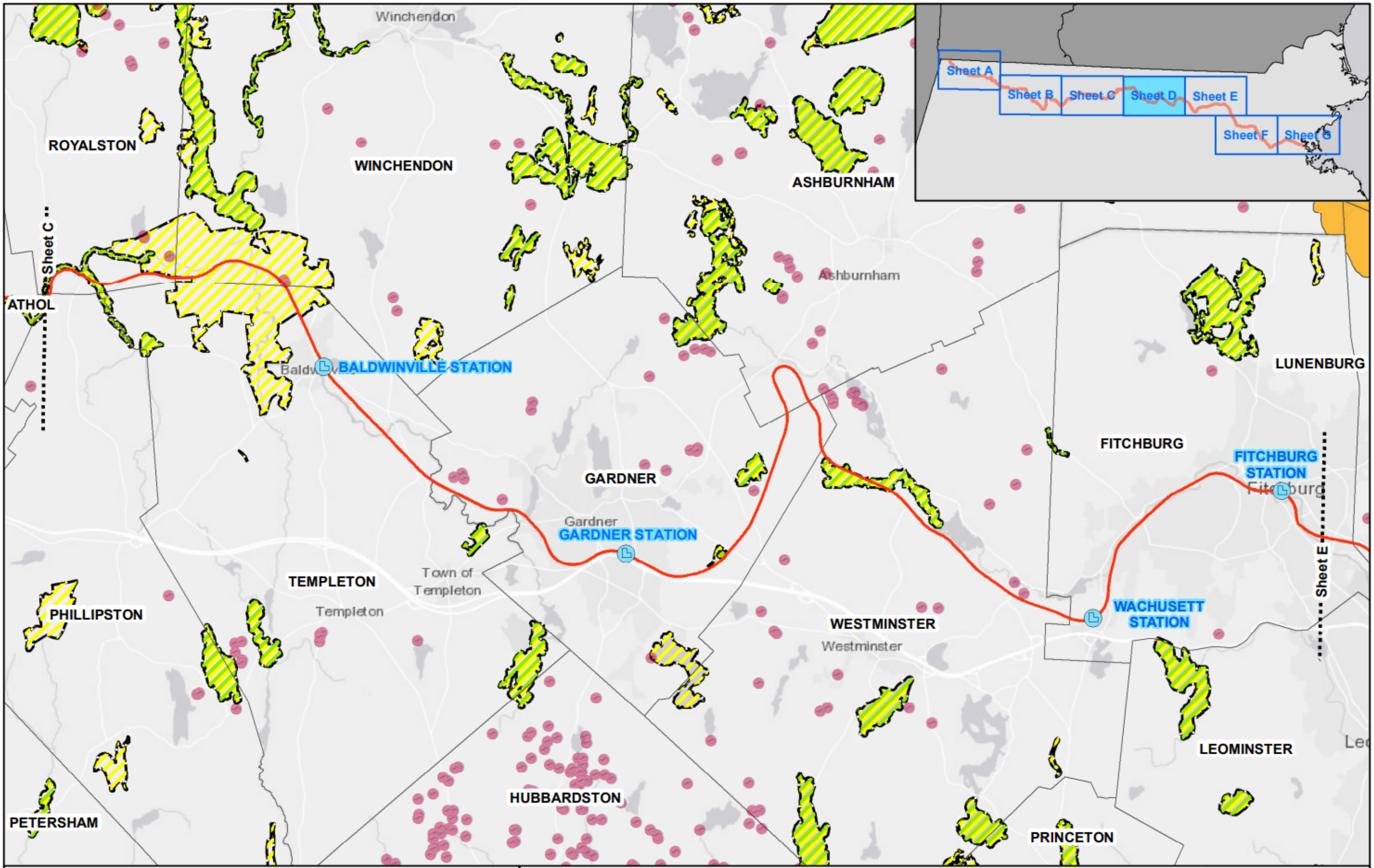

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet D

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- ● Certified Vernal Pool
- Rail Station
- Chapter 91 Jurisdiction
- OTS Northern Tier Railline
- ☐ Town Boundary
- ▨ NHESP Estimated Habitat
- ▨ NHESP Priority Habitat
- 🟪 Outstanding Resource Water
- 🟧 Areas of Critical Environmental Concern

0 1 2 3 4 5 Miles

N

Note:
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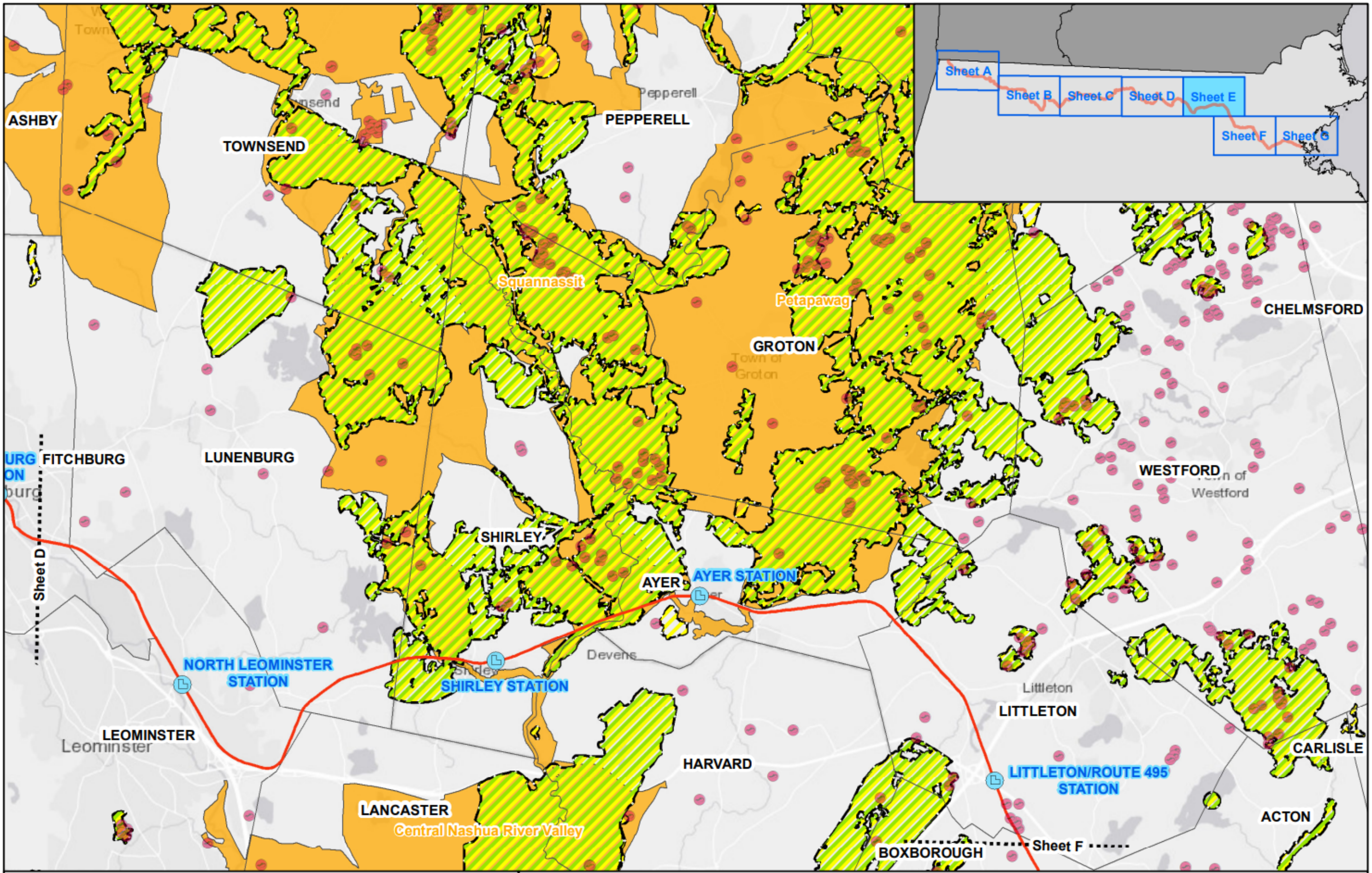

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet E

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

● Certified Vernal Pool

Rail Station

Chapter 91 Jurisdiction

OTS Northern Tier Railline

☐ Town Boundary

▨ NHESP Estimated Habitat

▨ NHESP Priority Habitat

🟪 Outstanding Resource Water

🟧 Areas of Critical Environmental Concern

0 1 2 3 4 5 Miles

N

Note:
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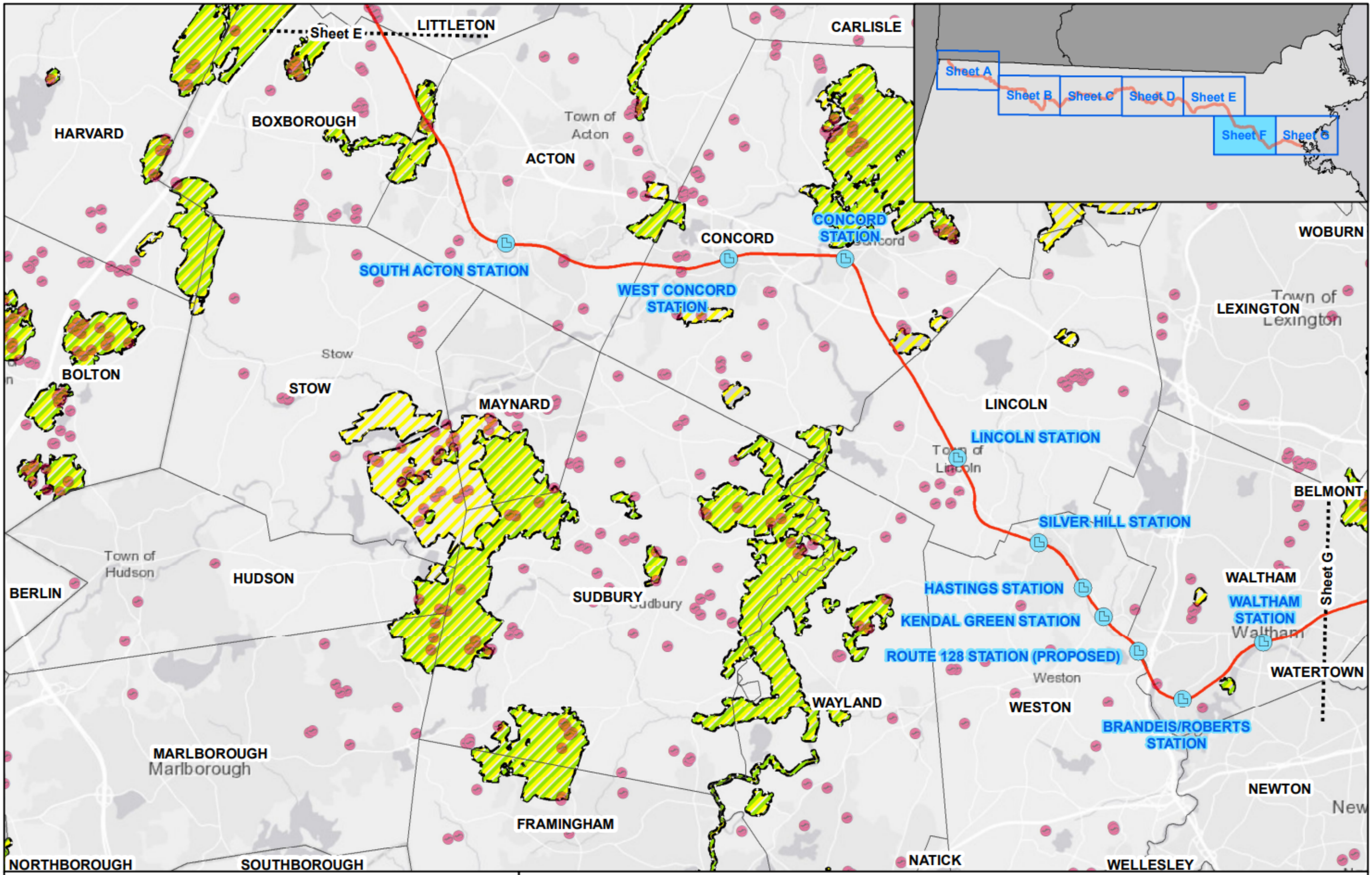

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet F

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

● Certified Vernal Pool

Rail Station

Chapter 91 Jurisdiction

OTS Northern Tier Railline

☐ Town Boundary

▨ NHESP Estimated Habitat

▨ NHESP Priority Habitat

🟪 Outstanding Resource Water

🟧 Areas of Critical Environmental Concern

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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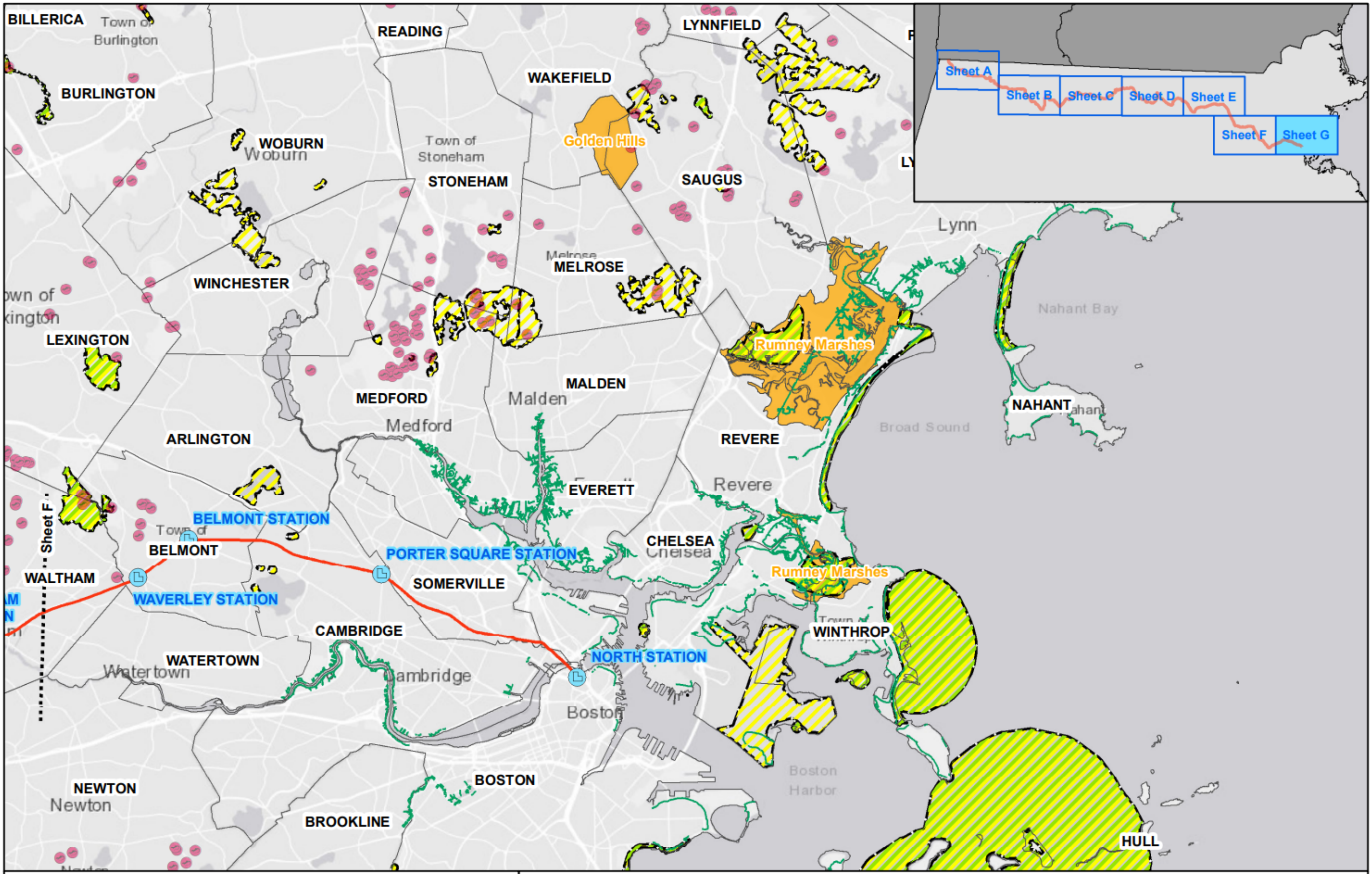

Environmental Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 4

Sheet G

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

● Certified Vernal Pool

Ⓑ Rail Station

— Chapter 91 Jurisdiction

— OTS Northern Tier Railline

☐ Town Boundary

▨ NHESP Estimated Habitat

▨ NHESP Priority Habitat

🟪 Outstanding Resource Water

🟧 Areas of Critical Environmental Concern

0 1 2 3 4 5 Miles

N

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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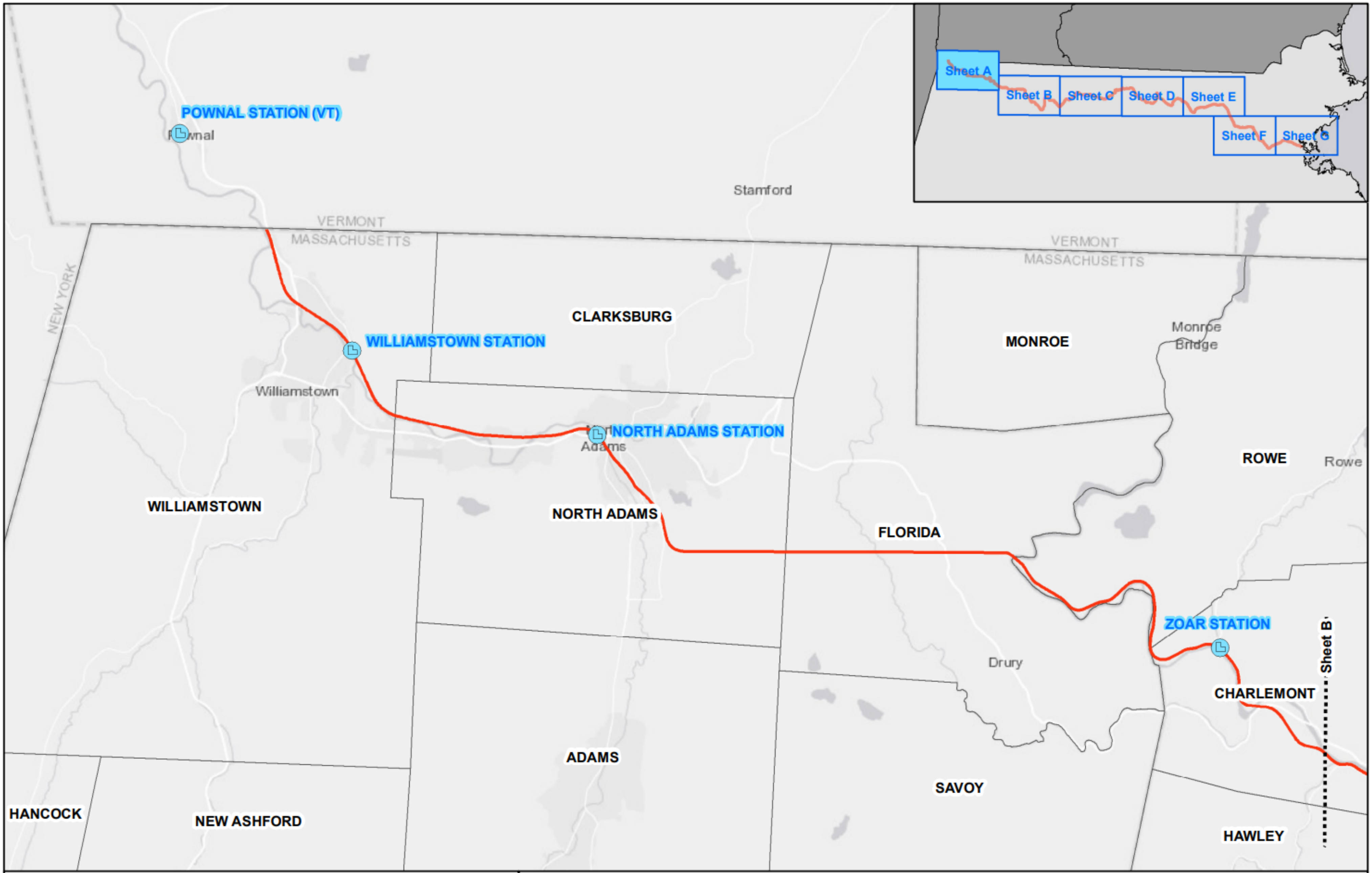

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet A

HNTB **massDOT** Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

● Rail Station

— OTS Northern Tier Railline

☐ Town Boundary

Flood Zone Designations

🟩 A: 1% Annual Chance of Flooding, no BFE

🟦 AE: 1% Annual Chance of Flooding, with BFE

▨ AE: Regulatory Floodway

🟪 VE: High Risk Coastal Area

🟧 X: 0.2% Annual Chance of Flooding

▨ Area with no DFIRM - Paper FIRMs in Effect

▨ Area Not Included

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

N

0 1 2 3 4 5 Miles

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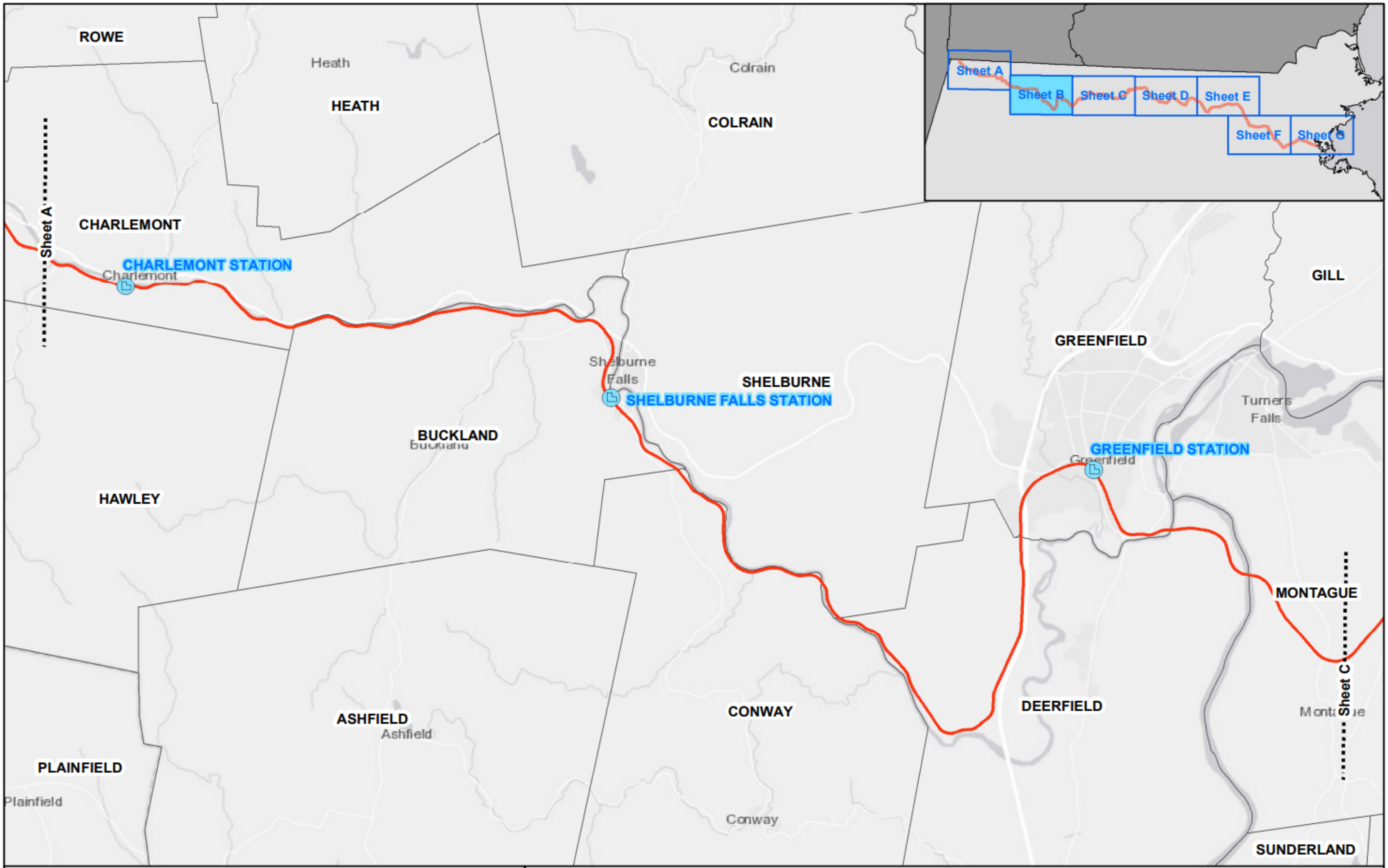

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet B

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

●	Rail Station
—	OTS Northern Tier Railline
☐	Town Boundary
Flood Zone Designations	
🟩	A: 1% Annual Chance of Flooding, no BFE
🟦	AE: 1% Annual Chance of Flooding, with BFE
▨	AE: Regulatory Floodway
🟪	VE: High Risk Coastal Area
🟧	X: 0.2% Annual Chance of Flooding
▨	Area with no DFIRM - Paper FIRMs in Effect
▨	Area Not Included

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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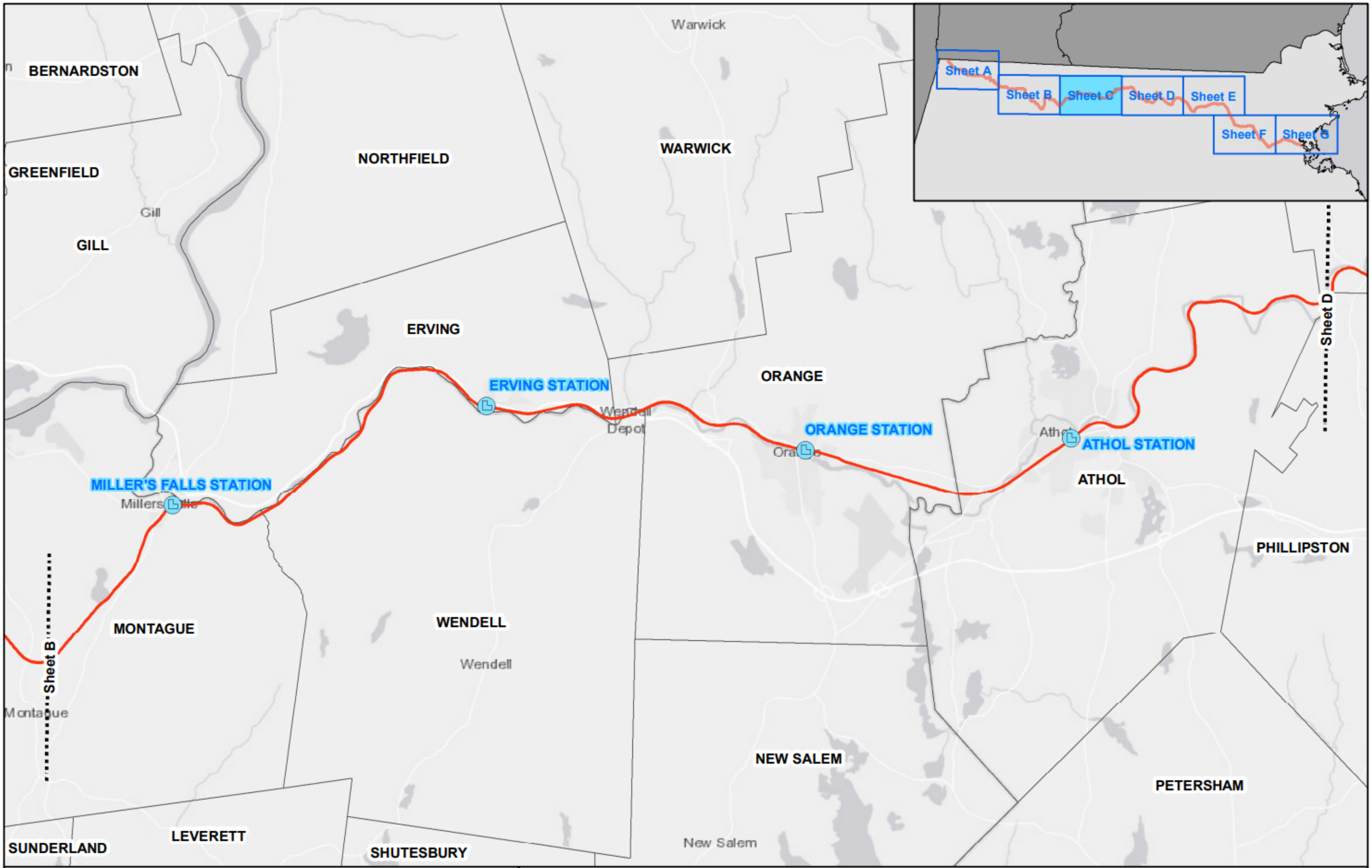

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet C

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- ⓛ Rail Station
- ━ OTS Northern Tier Railline
- ☐ Town Boundary

Flood Zone Designations

- 🟩 A: 1% Annual Chance of Flooding, no BFE
- 🟦 AE: 1% Annual Chance of Flooding, with BFE
- ▨ AE: Regulatory Floodway
- 🟪 VE: High Risk Coastal Area
- 🟧 X: 0.2% Annual Chance of Flooding
- ▨ Area with no DFIRM - Paper FIRMs in Effect
- ▨ Area Not Included

Note:
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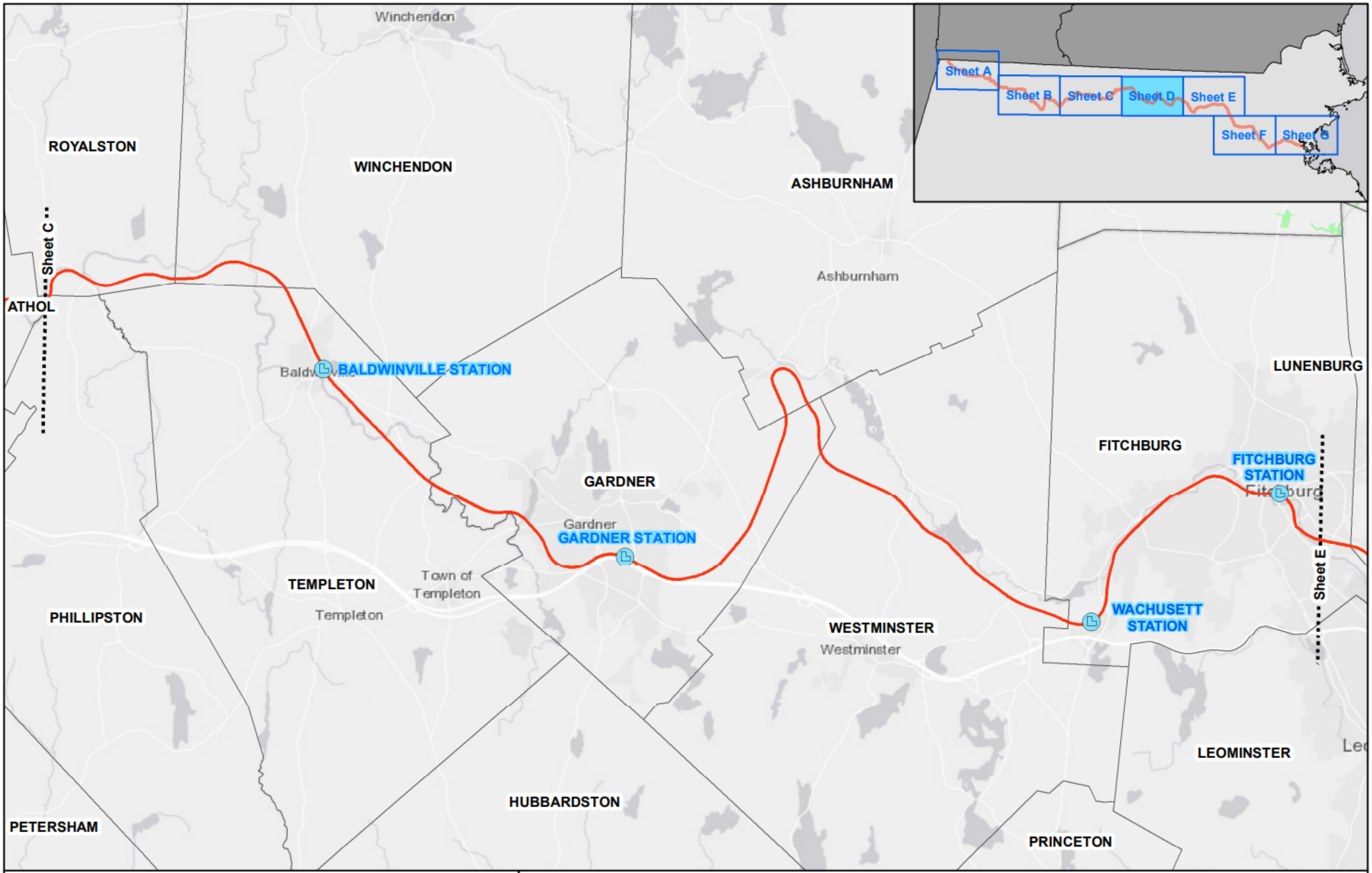

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet D

HNTB massDOT
Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓛ Rail Station
- ― OTS Northern Tier Railline
- ☐ Town Boundary

Flood Zone Designations

- 🟩 A: 1% Annual Chance of Flooding, no BFE
- 🟦 AE: 1% Annual Chance of Flooding, with BFE
- ▨ AE: Regulatory Floodway
- 🟪 VE: High Risk Coastal Area
- 🟧 X: 0.2% Annual Chance of Flooding
- ▨ Area with no DFIRM - Paper FIRMs in Effect
- ▨ Area Not Included

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

N

0 1 2 3 4 5 Miles

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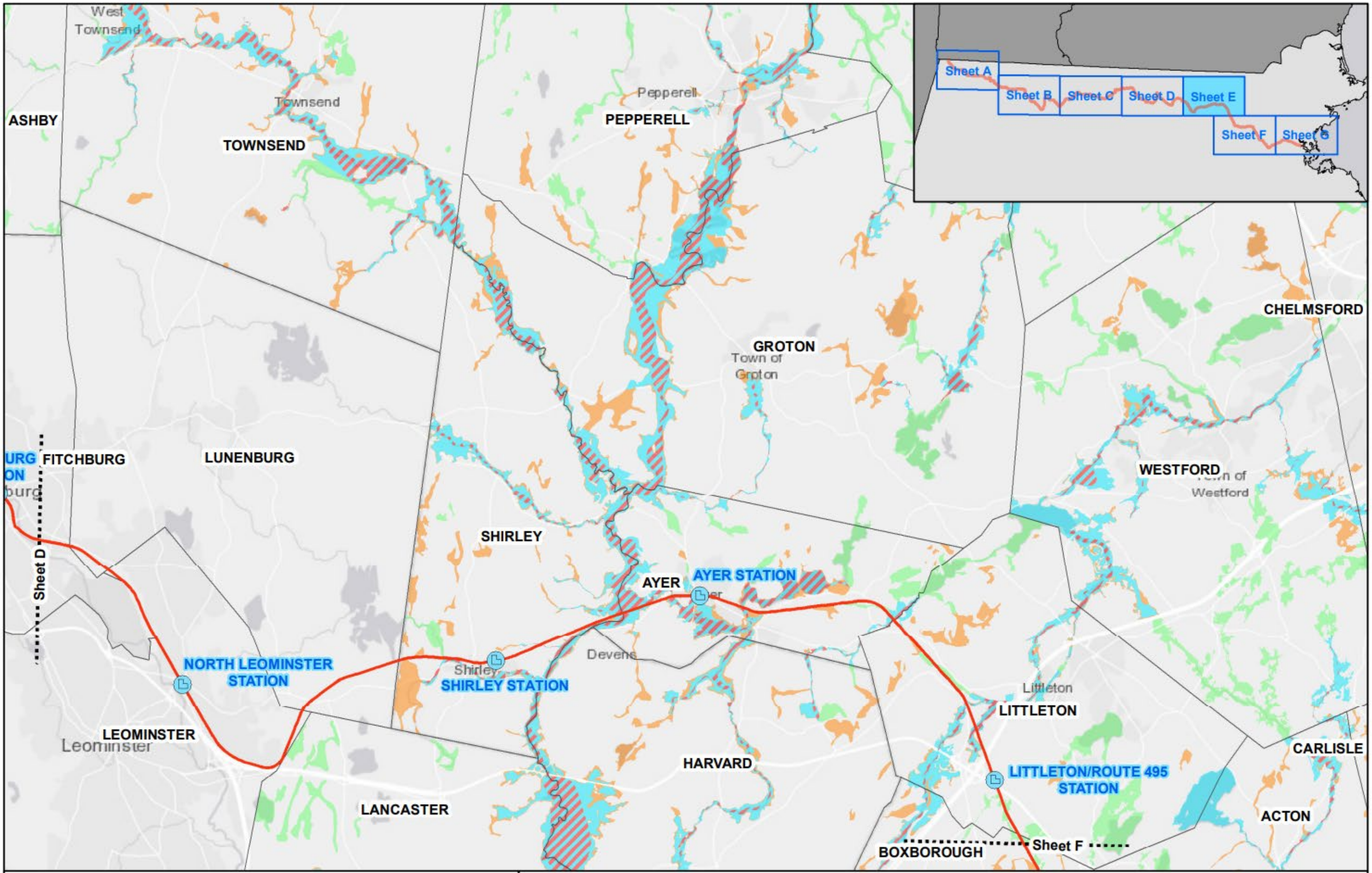

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet E

HNTB *massDOT* Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓑ Rail Station
- — OTS Northern Tier Railline
- ☐ Town Boundary

Flood Zone Designations

- 🟩 A: 1% Annual Chance of Flooding, no BFE
- 🟦 AE: 1% Annual Chance of Flooding, with BFE
- ▨ AE: Regulatory Floodway
- 🟪 VE: High Risk Coastal Area
- 🟧 X: 0.2% Annual Chance of Flooding
- ▨ Area with no DFIRM - Paper FIRMs in Effect
- ▨ Area Not Included

Note:
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N

0 1 2 3 4 5 Miles

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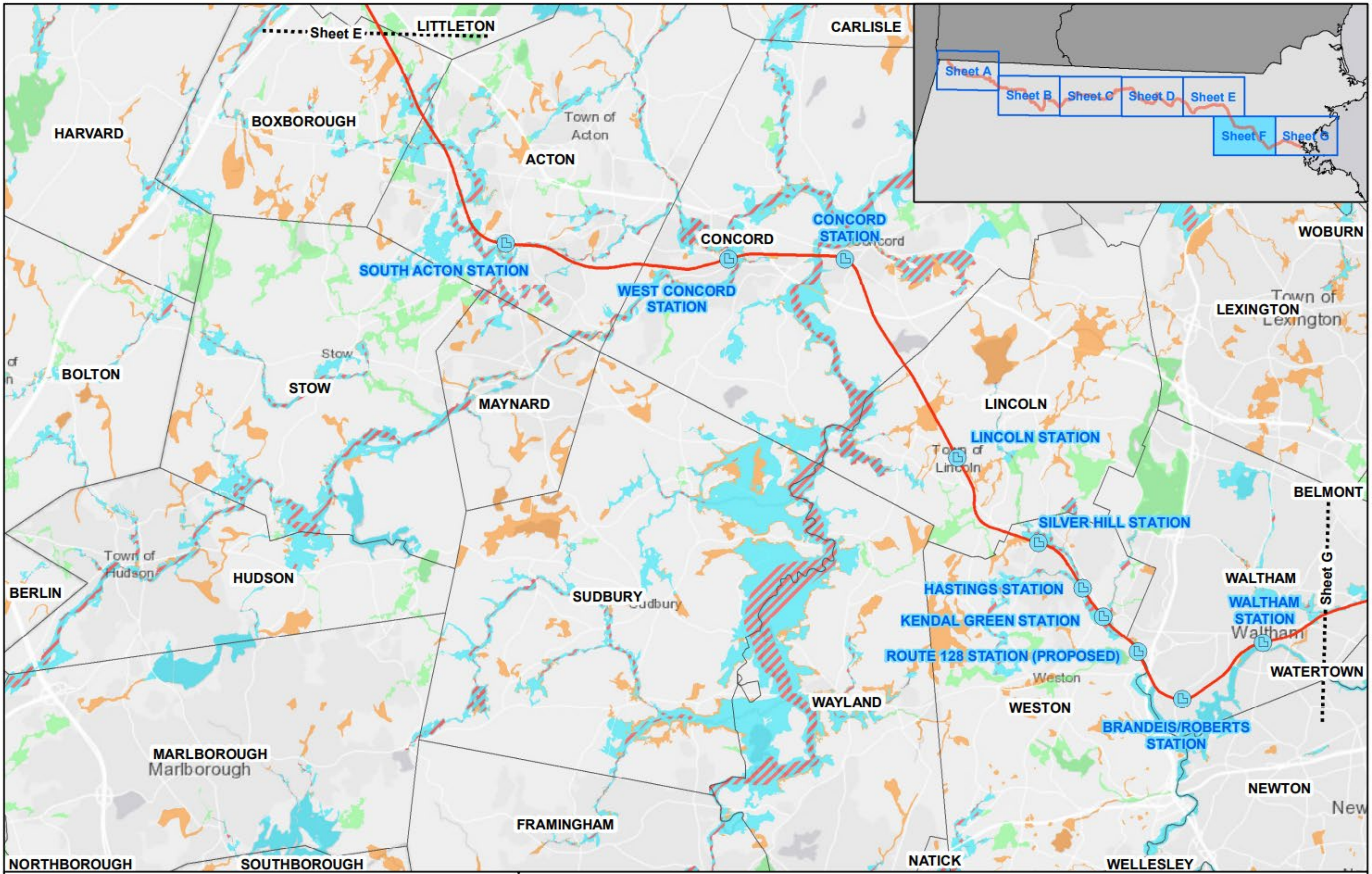

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet F

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

● Rail Station

— OTS Northern Tier Railline

☐ Town Boundary

Flood Zone Designations

🟩 A: 1% Annual Chance of Flooding, no BFE

🟦 AE: 1% Annual Chance of Flooding, with BFE

▨ AE: Regulatory Floodway

🟪 VE: High Risk Coastal Area

🟧 X: 0.2% Annual Chance of Flooding

▨ Area with no DFIRM - Paper FIRMs in Effect

▨ Area Not Included

Note:
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N

0 1 2 3 4 5 Miles

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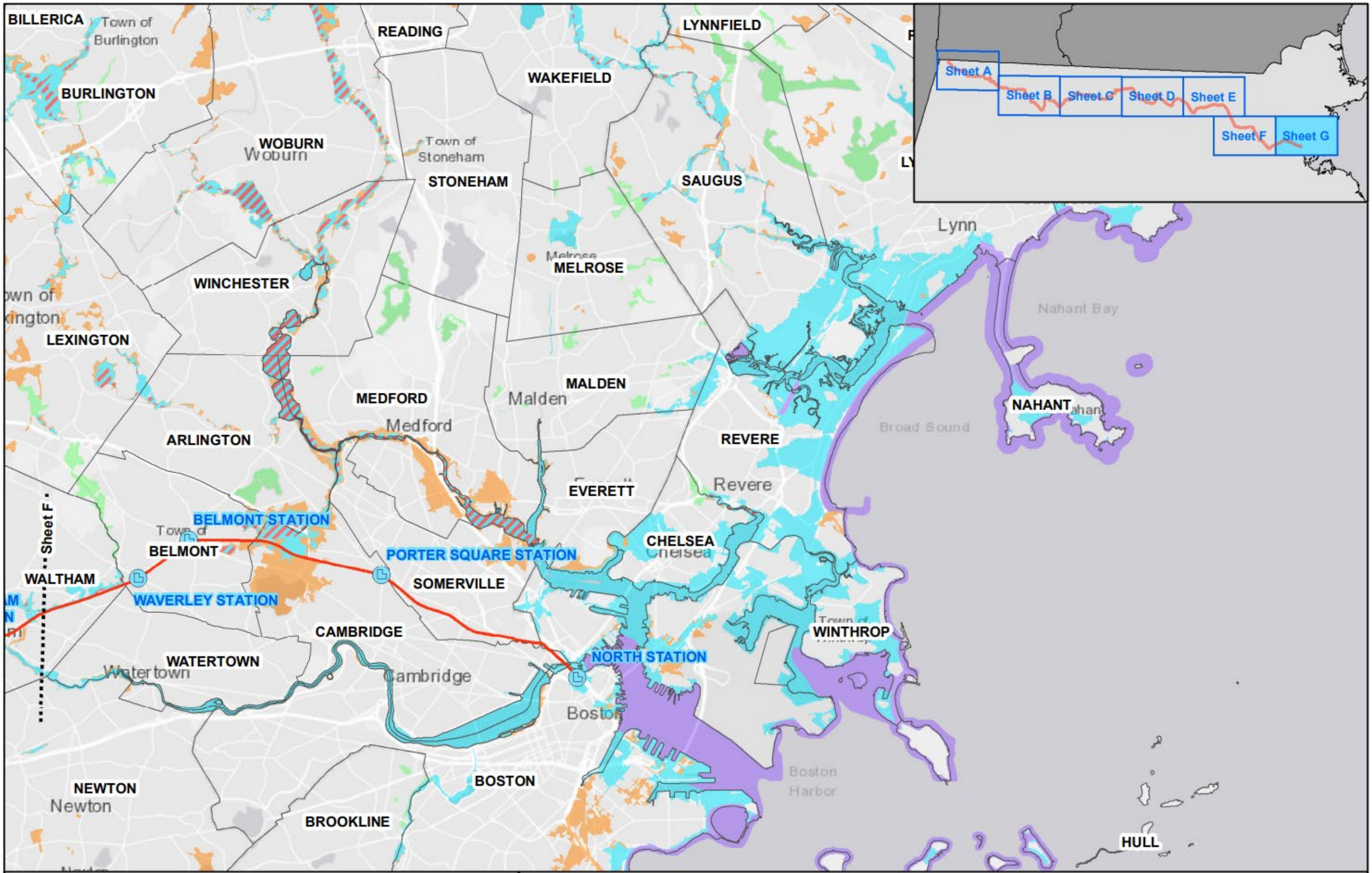

Floodplain Map

MassDOT Northern Tier Passenger Rail Study

Figure 3

Sheet G

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓑ Rail Station
- ― OTS Northern Tier Railline
- ☐ Town Boundary

Flood Zone Designations

- 🟩 A: 1% Annual Chance of Flooding, no BFE
- ■ AE: 1% Annual Chance of Flooding, with BFE
- ▨ AE: Regulatory Floodway
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- 🟧 X: 0.2% Annual Chance of Flooding
- ▨ Area with no DFIRM - Paper FIRMs in Effect
- ▨ Area Not Included

Note:
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N

0 1 2 3 4 5 Miles

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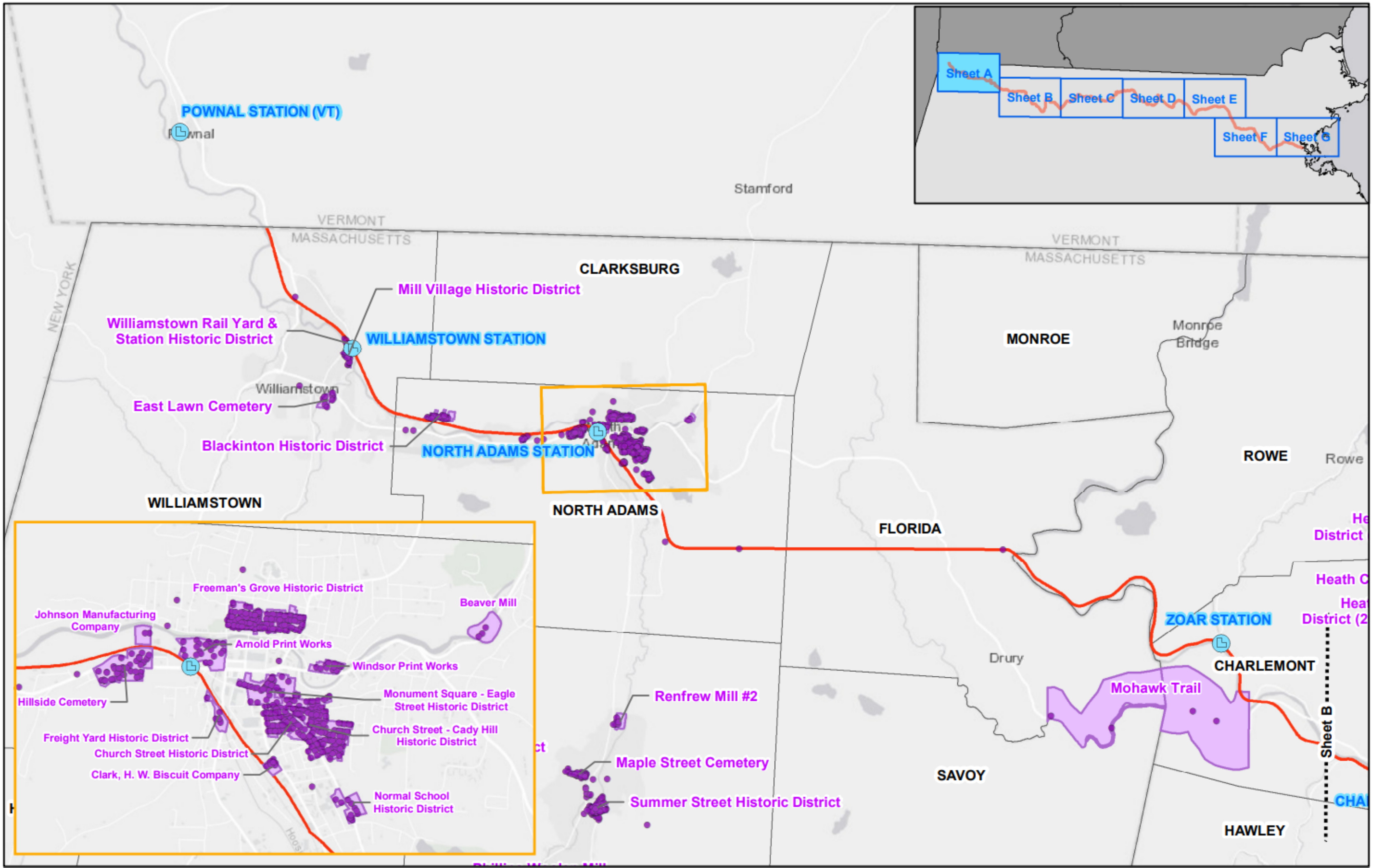
Sheet A
Sheet B
Sheet C
Sheet D
Sheet E
Sheet F
Sheet G
POWNAL STATION (VT)
Pownal
Stamford
VERMONT
MASSACHUSETTS
NEW YORK
CLARKSBURG
Mill Village Historic District
Williamstown Rail Yard & Station Historic District
WILLIAMSTOWN STATION
Williamstown
East Lawn Cemetery
Blackinton Historic District
NORTH ADAMS STATION
WILLIAMSTOWN
NORTH ADAMS
MONROE
Monroe Bridge
ROWE
Rowe
FLORIDA
ZOAR STATION
CHARLEMONT
Drury
Mohawk Trail
SAVOY
HAWLEY
Sheet B
Renfrew Mill #2
Maple Street Cemetery
Summer Street Historic District
Freeman's Grove Historic District
Beaver Mill
Johnson Manufacturing Company
Arnold Print Works
Windsor Print Works
Hillside Cemetery
Monument Square - Eagle Street Historic District
Church Street - Cady Hill Historic District
Freight Yard Historic District
Church Street Historic District
Clark, H. W. Biscuit Company
Normal School Historic District

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet A

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓛ Rail Station
- ● National Register of Historic Places Listed Properties
- ☆ Massachusetts Historic Landmark Properties
- — OTS Northern Tier Railline
- ▨ National Register of Historic Places Listed Districts
- ▨ Massachusetts Historic Landmark Districts
- ☐ Town Boundary

0 1 2 3 4 5 Miles

N

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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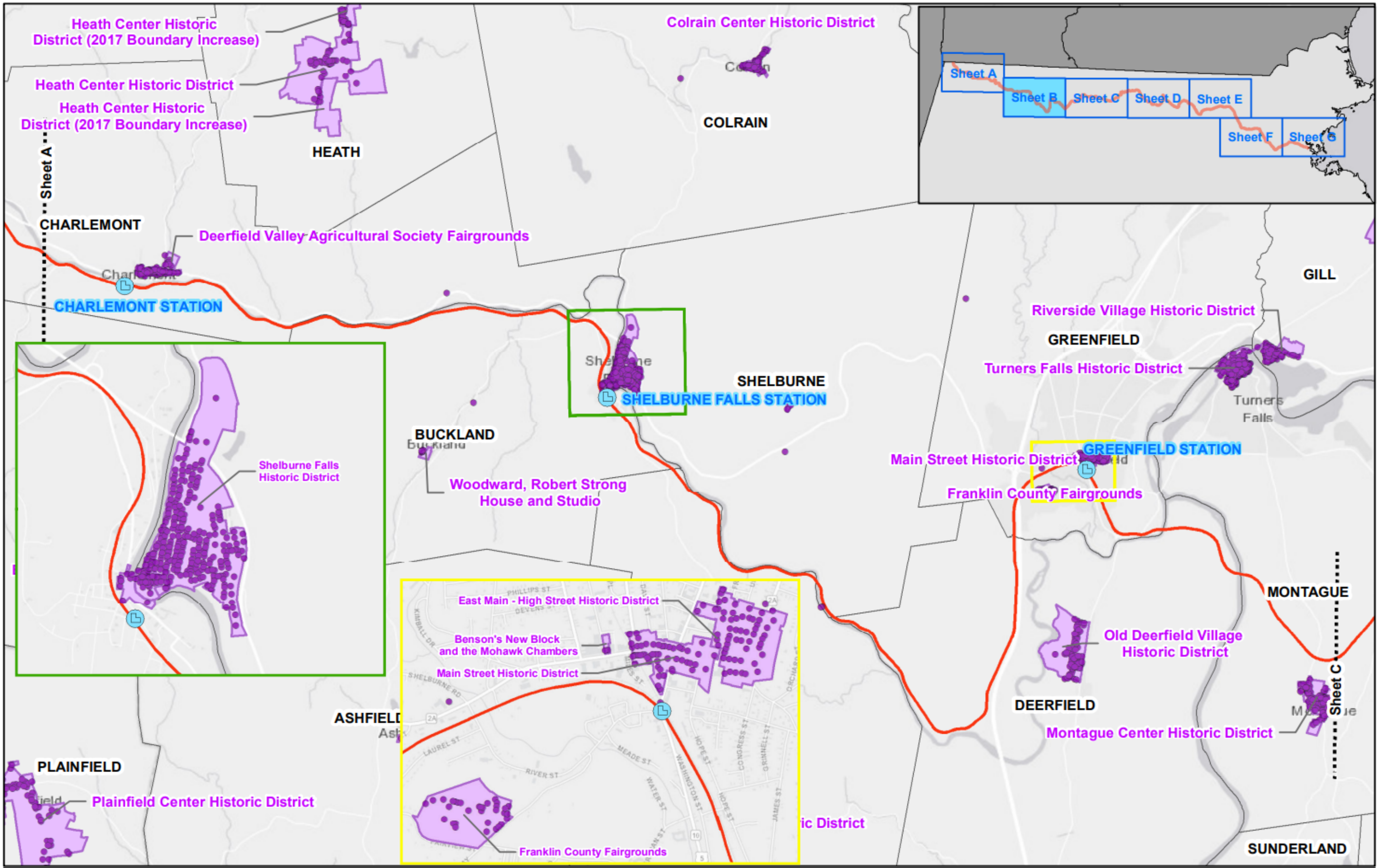
Heath Center Historic District (2017 Boundary Increase)
Heath Center Historic District
Heath Center Historic District (2017 Boundary Increase)
HEATH
Colrain Center Historic District
COLRAIN
Sheet A
CHARLEMONT
Deerfield Valley Agricultural Society Fairgrounds
CHARLEMONT STATION
Shelburne Falls Historic District
SHELBURNE
SHELBURNE FALLS STATION
BUCKLAND
Woodward, Robert Strong House and Studio
GILL
Riverside Village Historic District
GREENFIELD
Turners Falls Historic District
Turners Falls
Main Street Historic District
GREENFIELD STATION
Franklin County Fairgrounds
MONTAGUE
Old Deerfield Village Historic District
DEERFIELD
Sheet C
Montague Center Historic District
ASHFIELD
PLAINFIELD
Plainfield Center Historic District
East Main - High Street Historic District
Benson's New Block and the Mohawk Chambers
Main Street Historic District
Franklin County Fairgrounds
SUNDERLAND
Sheet A
Sheet B
Sheet C
Sheet D
Sheet E
Sheet F
Sheet G

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet B

Boston, MA

March 2022

Legend

ⓑ	Rail Station
●	National Register of Historic Places Listed Properties
☆	Massachusetts Historic Landmark Properties
—	OTS Northern Tier Railline
▨	National Register of Historic Places Listed Districts
▨	Massachusetts Historic Landmark Districts
☐	Town Boundary

0 1 2 3 4 5 Miles

N

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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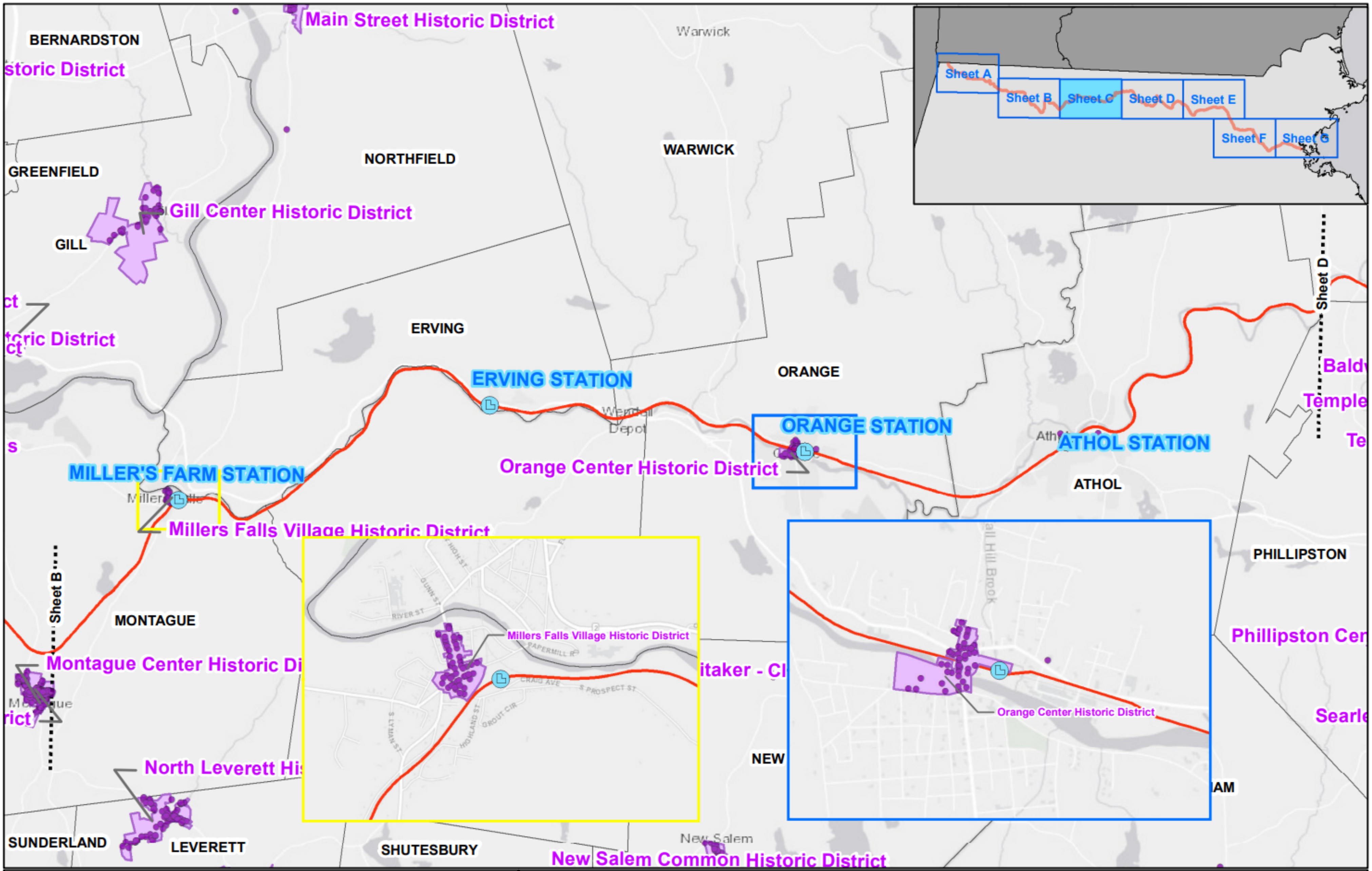

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet C

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓛ Rail Station

● National Register of Historic Places Listed Properties

☆ Massachusetts Historic Landmark Properties

— OTS Northern Tier Railline

▨ National Register of Historic Places Listed Districts

▨ Massachusetts Historic Landmark Districts

☐ Town Boundary

N

0 1 2 3 4 5 Miles

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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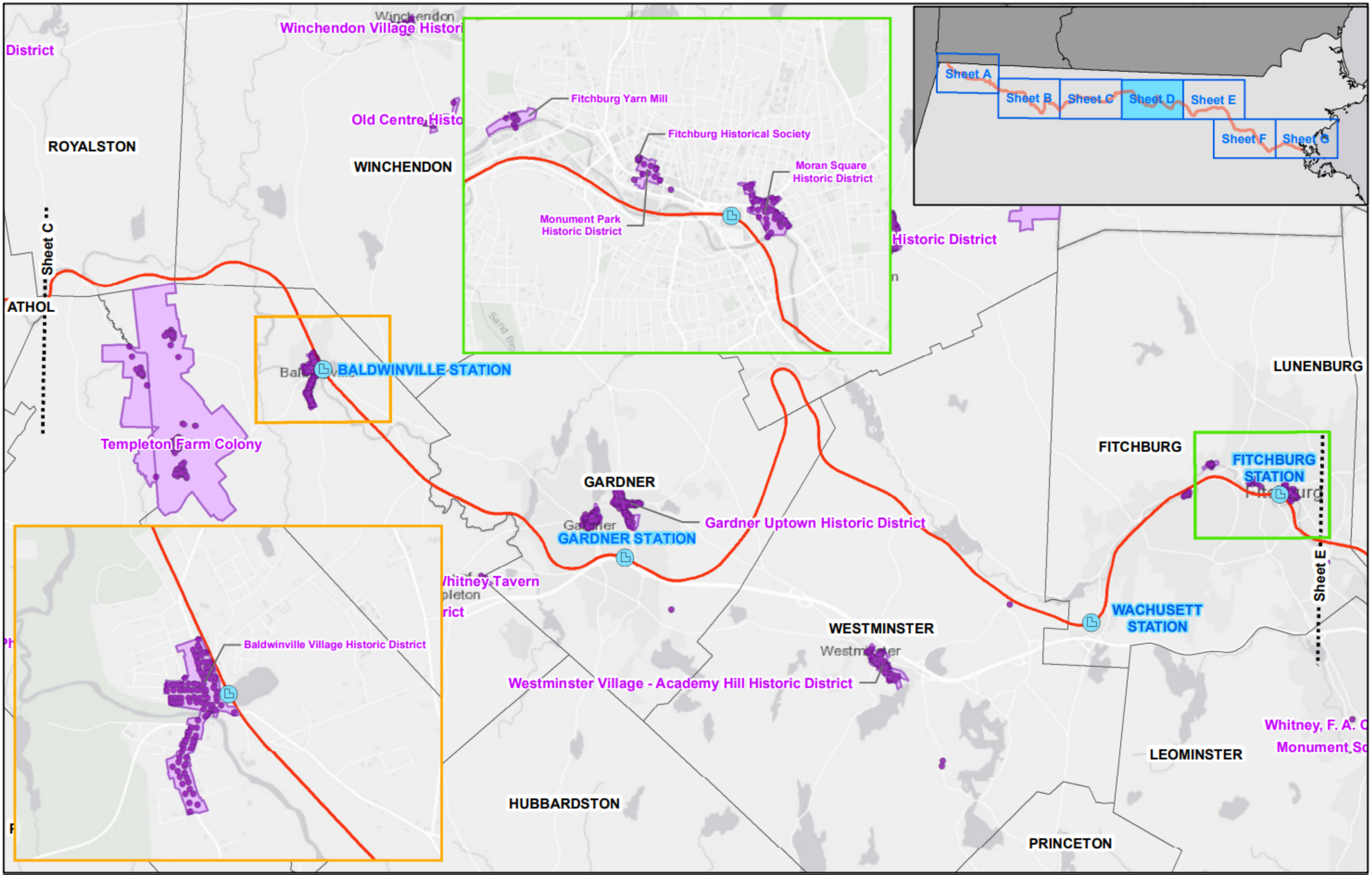

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet D

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

◎ Rail Station

● National Register of Historic Places Listed Properties

☆ Massachusetts Historic Landmark Properties

— OTS Northern Tier Railline

🟪 National Register of Historic Places Listed Districts

▨ Massachusetts Historic Landmark Districts

☐ Town Boundary

N

0 1 2 3 4 5 Miles

Note:
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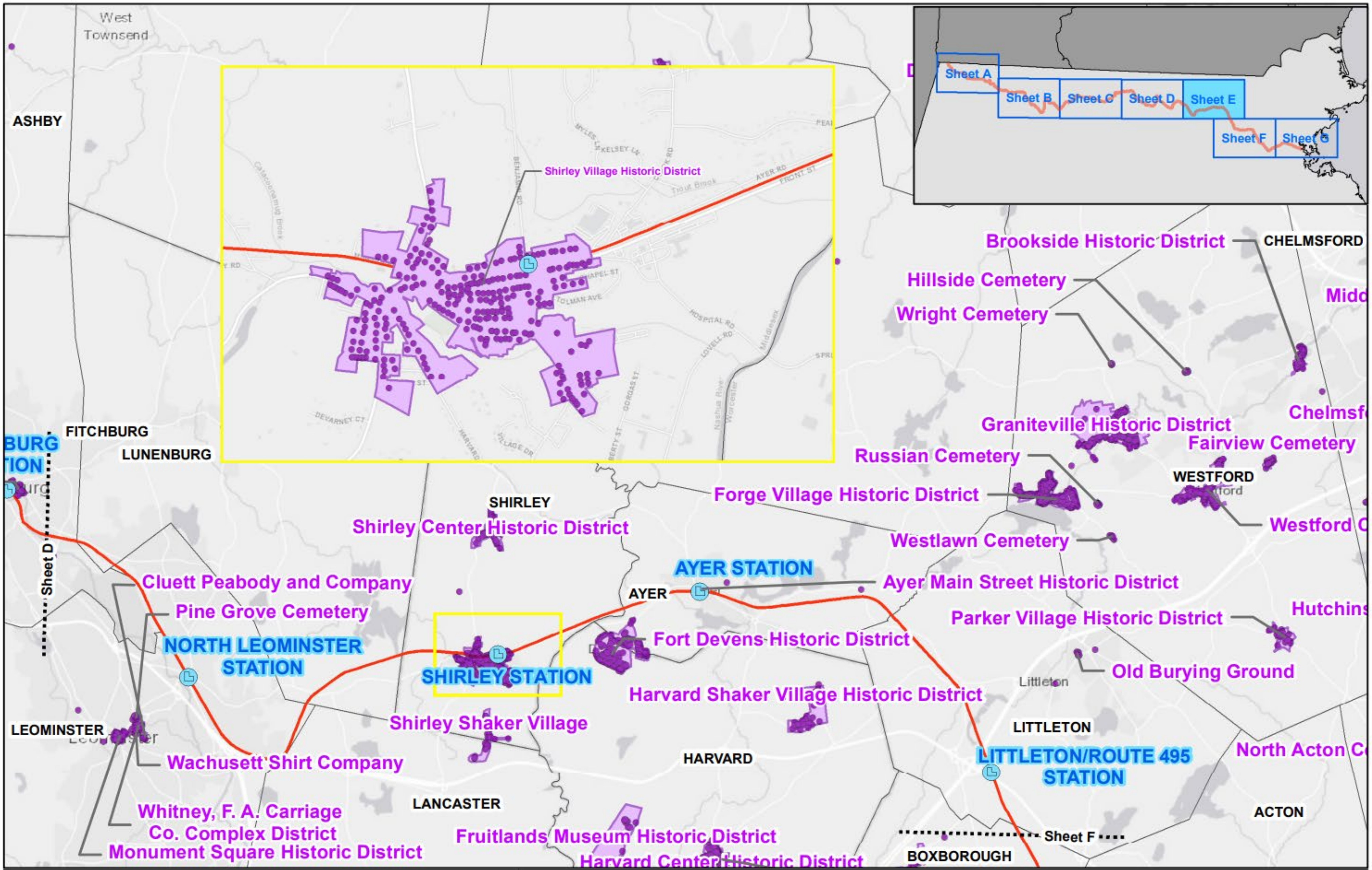
West Townsend
ASHBY
Sheet A
Sheet B
Sheet C
Sheet D
Sheet E
Sheet F
Sheet G
Shirley Village Historic District
Brookside Historic District
CHELMSFORD
Hillside Cemetery
Midd
Wright Cemetery
Chelmsf
Graniteville Historic District
Fairview Cemetery
FITCHBURG
LUNENBURG
Russian Cemetery
WESTFORD
Forge Village Historic District
Westford C
SHIRLEY
Shirley Center Historic District
Westlawn Cemetery
Sheet D
Cluett Peabody and Company
AYER STATION
Ayer Main Street Historic District
AYER
Pine Grove Cemetery
Parker Village Historic District
Hutchins
NORTH LEOMINSTER STATION
Fort Devens Historic District
SHIRLEY STATION
Old Bury ing Ground
Littleton
Harvard Shaker Village Historic District
Shirley Shaker Village
LITTLETON
LEOMINSTER
Wachusett Shirt Company
HARVARD
LITTLETON/ROUTE 495 STATION
North Acton C
LANCASTER
Whitney, F. A. Carriage Co. Complex District
ACTON
Fruitlands Museum Historic District
Sheet F
Monument Square Historic District
BOXBOROUGH
Harvard Center Historic District

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet E

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓑ Rail Station
- ● National Register of Historic Places Listed Properties
- ☆ Massachusetts Historic Landmark Properties
- — OTS Northern Tier Railline
- ▨ National Register of Historic Places Listed Districts
- ▨ Massachusetts Historic Landmark Districts
- ☐ Town Boundary

0 1 2 3 4 5 Miles

N

Note:
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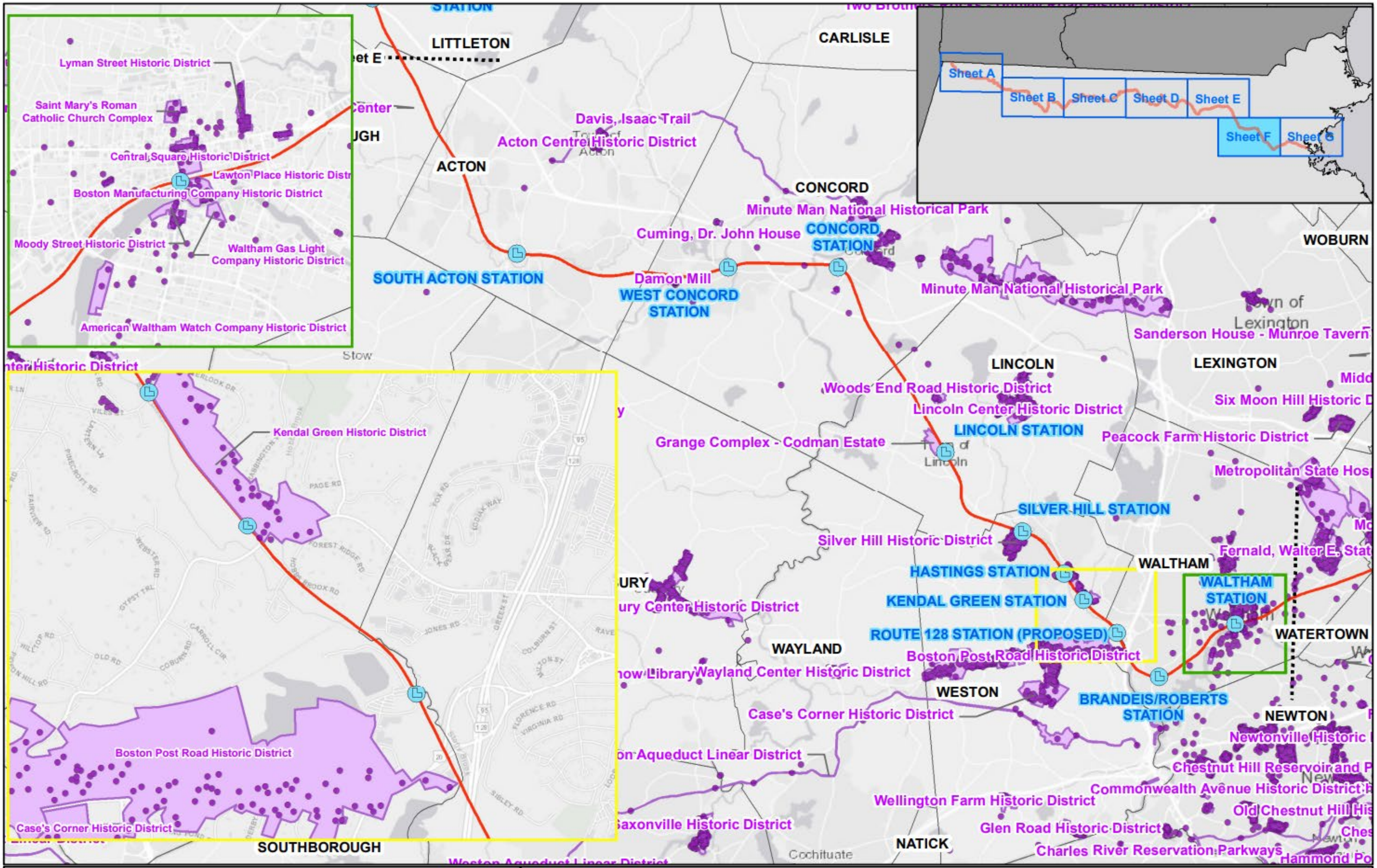
Lyman Street Historic District
Saint Mary's Roman Catholic Church Complex
Central Square Historic District
Lawton Place Historic Distr
Boston Manufacturing Company Historic District
Moody Street Historic District
Waltham Gas Light Company Historic District
American Waltham Watch Company Historic District
Kendal Green Historic District
Boston Post Road Historic District
Case's Corner Historic District
LITTLETON
CARLISLE
ACTON
CONCORD
Davis, Isaac Trail
Acton Centre Historic District
Minute Man National Historical Park
Cuming, Dr. John House
CONCORD STATION
SOUTH ACTON STATION
Damon Mill
WEST CONCORD STATION
Minute Man National Historical Park
WOBURN
Town of Lexington
Sanderson House - Munroe Tavern
LEXINGTON
LINCOLN
Woods End Road Historic District
Lincoln Center Historic District
LINCOLN STATION
Six Moon Hill Historic D
Peacock Farm Historic District
Grange Complex - Codman Estate
Metropolitan State Hos
SILVER HILL STATION
Silver Hill Historic District
Fernald, Walter E. Stat
WALTHAM
HASTINGS STATION
WALTHAM STATION
KENDAL GREEN STATION
ROUTE 128 STATION (PROPOSED)
WATERTOWN
Boston Post Road Historic District
WAYLAND
Wayland Center Historic District
WESTON
BRANDEIS/ROBERTS STATION
Case's Corner Historic District
NEWTON
Newtonville Historic
Chestnut Hill Reservoir and P
Commonwealth Avenue Historic District
Old Chestnut Hill His
Wellington Farm Historic District
Glen Road Historic District
Charles River Reservation Parkways
Hammond Po
Aqueduct Linear District
Saxonville Historic District
NATICK
Cochituate
SOUTHBOROUGH
Weston Aqueduct Linear District
Stow
Sheet A
Sheet B
Sheet C
Sheet D
Sheet E
Sheet F
Sheet G

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet F

HNTB **massDOT** Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓑ Rail Station
- ● National Register of Historic Places Listed Properties
- ☆ Massachusetts Historic Landmark Properties
- — OTS Northern Tier Railline
- ▨ National Register of Historic Places Listed Districts
- ▨ Massachusetts Historic Landmark Districts
- ☐ Town Boundary

0 1 2 3 4 5 Miles

N

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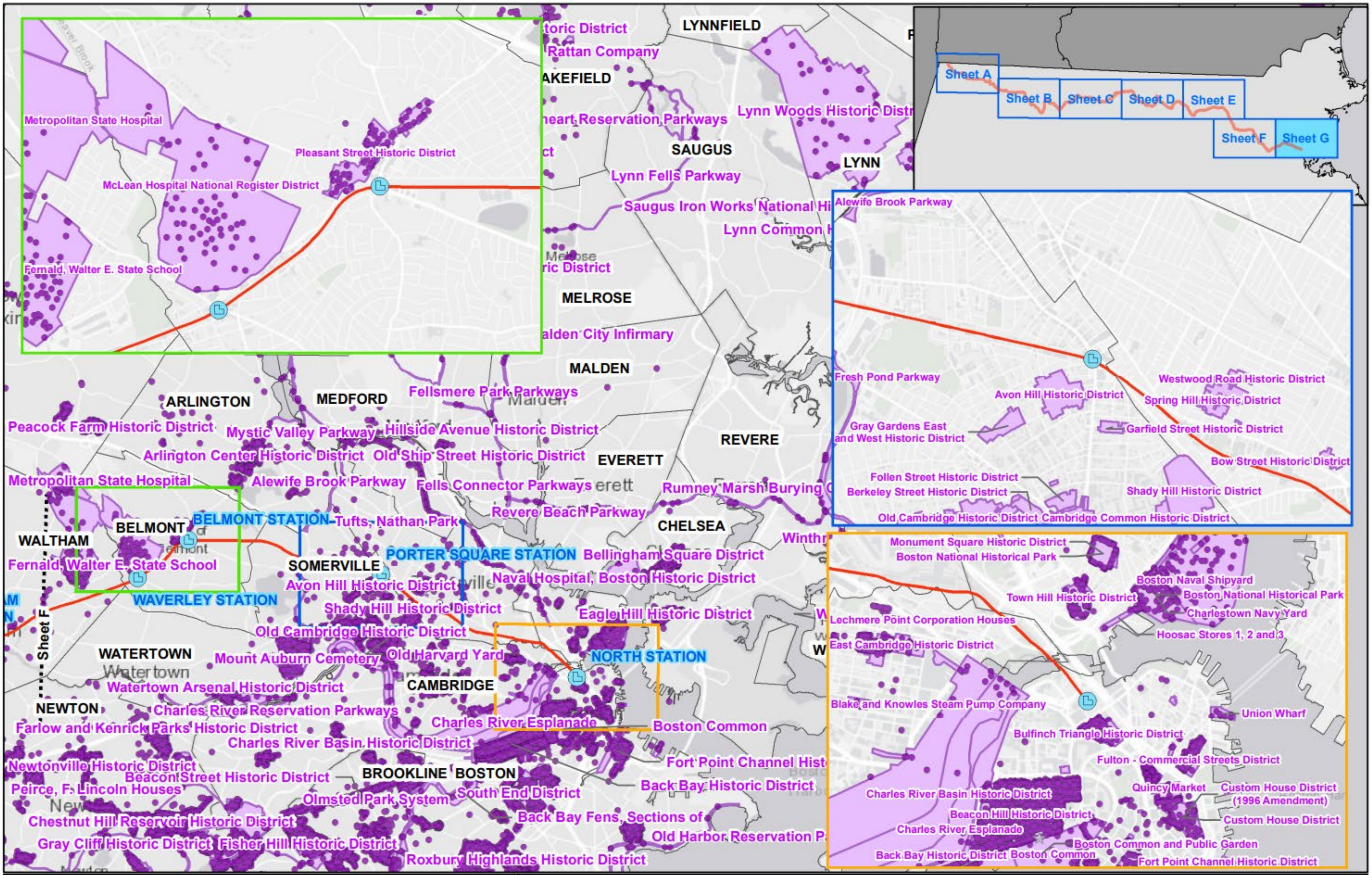
Sheet A
Sheet B
Sheet C
Sheet D
Sheet E
Sheet F
Sheet G
LYNNFIELD
Rattan Company
AKEFIELD
heart Reservation Parkways
Lynn Woods Historic Distr
SAUGUS
LYNN
Lynn Fells Parkway
Saugus Iron Works National Hi
Lynn Common H
ric District
MELROSE
alden City Infirmary
MALDEN
Metropolitan State Hospital
Pleasant Street Historic District
McLean Hospital National Register District
Fernald, Walter E. State School
ARLINGTON
MEDFORD
Fellsmere Park Parkways
Peacock Farm Historic District
Mystic Valley Parkway
Hillside Avenue Historic District
REVERE
Arlington Center Historic District
Old Ship Street Historic District
EVERETT
Metropolitan State Hospital
Alewife Brook Parkway
Fells Connector Parkways
Rumney Marsh Burying G
Revere Beach Parkway
BELMONT
BELMONT STATION
Tufts, Nathan Park
CHELSEA
WALTHAM
PORTER SQUARE STATION
Bellingham Square District
Fernald, Walter E. State School
SOMERVILLE
Naval Hospital, Boston Historic District
Avon Hill Historic District
WAVERLEY STATION
Shady Hill Historic District
Eagle Hill Historic District
Old Cambridge Historic District
Sheet F
WATERTOWN
Mount Auburn Cemetery
Old Harvard Yard
NORTH STATION
Watertown Arsenal Historic District
CAMBRIDGE
NEWTON
Charles River Reservation Parkways
Farlow and Kenrick Parks Historic District
Charles River Esplanade
Boston Common
Charles River Basin Historic District
Newtonville Historic District
Fort Point Channel Hist
Beacon Street Historic District
BROOKLINE
BOSTON
Peirce, F. Lincoln Houses
Back Bay Historic District
Olmsted Park System
South End District
Chestnut Hill Reservoir Historic District
Back Bay Fens, Sections of
Old Harbor Reservation P
Gray Cliff Historic District
Fisher Hill Historic District
Roxbury Highlands Historic District
Alewife Brook Parkway
Fresh Pond Parkway
Westwood Road Historic District
Avon Hill Historic District
Spring Hill Historic District
Gray Gardens East and West Historic District
Garfield Street Historic District
Bow Street Historic District
Follen Street Historic District
Berkeley Street Historic District
Shady Hill Historic District
Old Cambridge Historic District
Cambridge Common Historic District
Monument Square Historic District
Boston National Historical Park
Boston Naval Shipyard
Town Hill Historic District
Boston National Historical Park
Charlestown Navy Yard
Lechmere Point Corporation Houses
Hoosac Stores 1, 2 and 3
East Cambridge Historic District
Blake and Knowles Steam Pump Company
Union Wharf
Bulfinch Triangle Historic District
Fulton - Commercial Streets District
Quincy Market
Custom House District (1996 Amendment)
Charles River Basin Historic District
Beacon Hill Historic District
Custom House District
Charles River Esplanade
Boston Common and Public Garden
Back Bay Historic District
Boston Common
Fort Point Channel Historic District

Historical Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 6

Sheet G

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓑ Rail Station
- ● National Register of Historic Places Listed Properties
- ☆ Massachusetts Historic Landmark Properties
- — OTS Northern Tier Railline
- ▨ National Register of Historic Places Listed Districts
- ▨ Massachusetts Historic Landmark Districts
- ☐ Town Boundary

0 1 2 3 4 5 Miles

N

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

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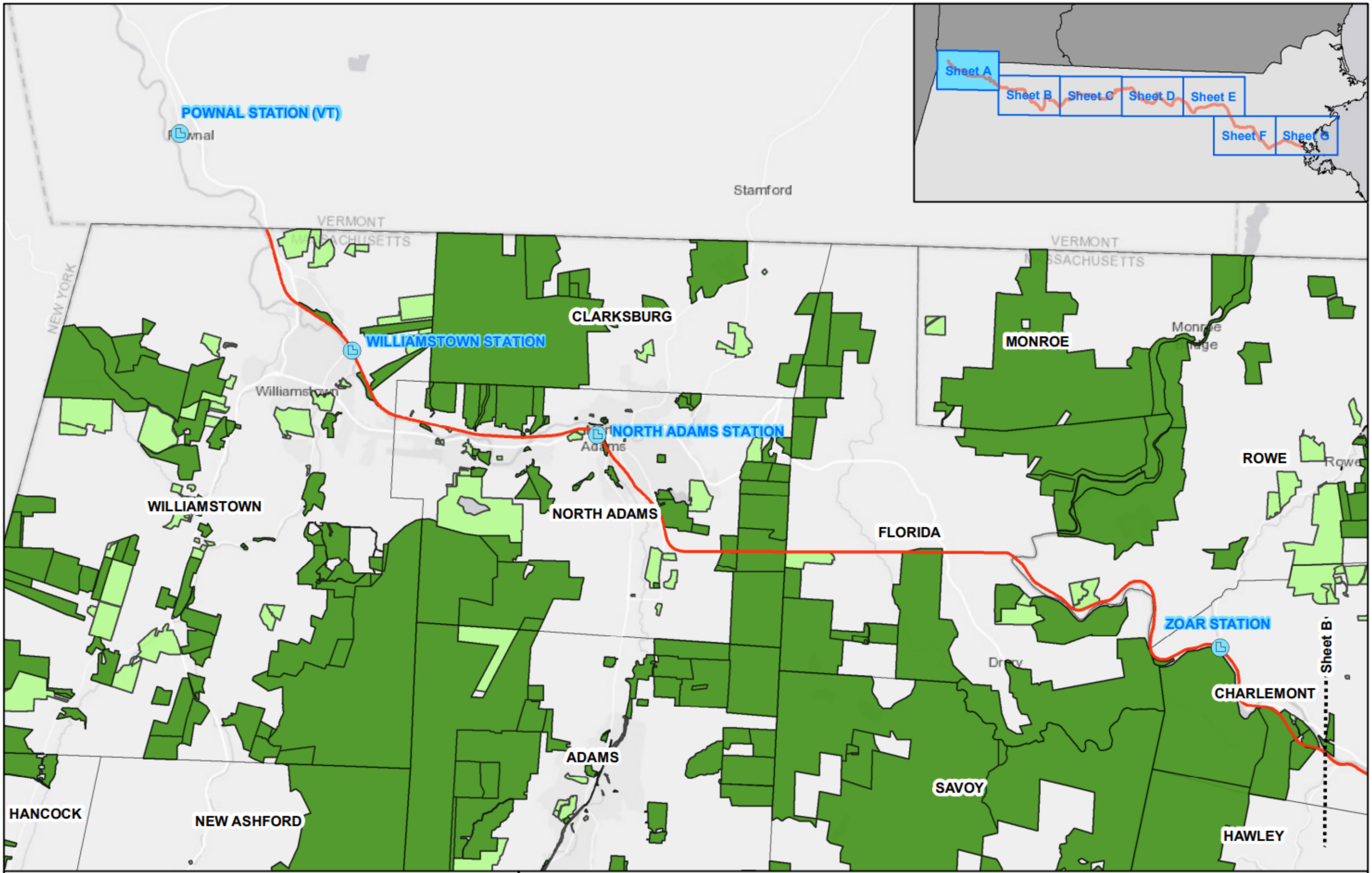

Protected Open Space

MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet A

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓛ Rail Station	🟩 Article 97 Properties
— OTS Northern Tier Railline	🟩 Protected Open Space
	☐ Town Boundary

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

0 1 2 3 4 5 Miles

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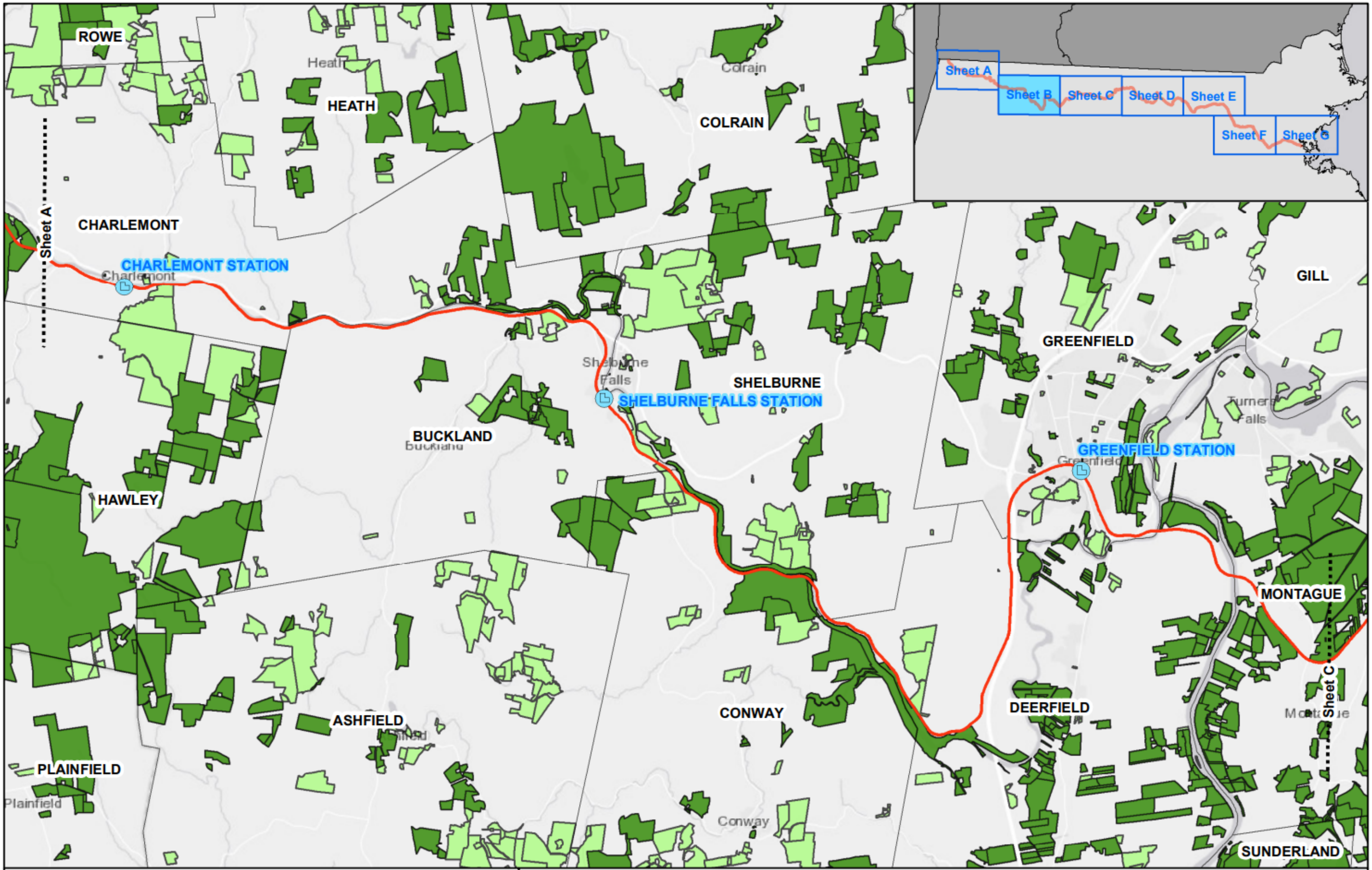

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MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet B

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓛ Rail Station
- — OTS Northern Tier Railline
- 🟩 Article 97 Properties
- 🟩 Protected Open Space
- ☐ Town Boundary

Note:
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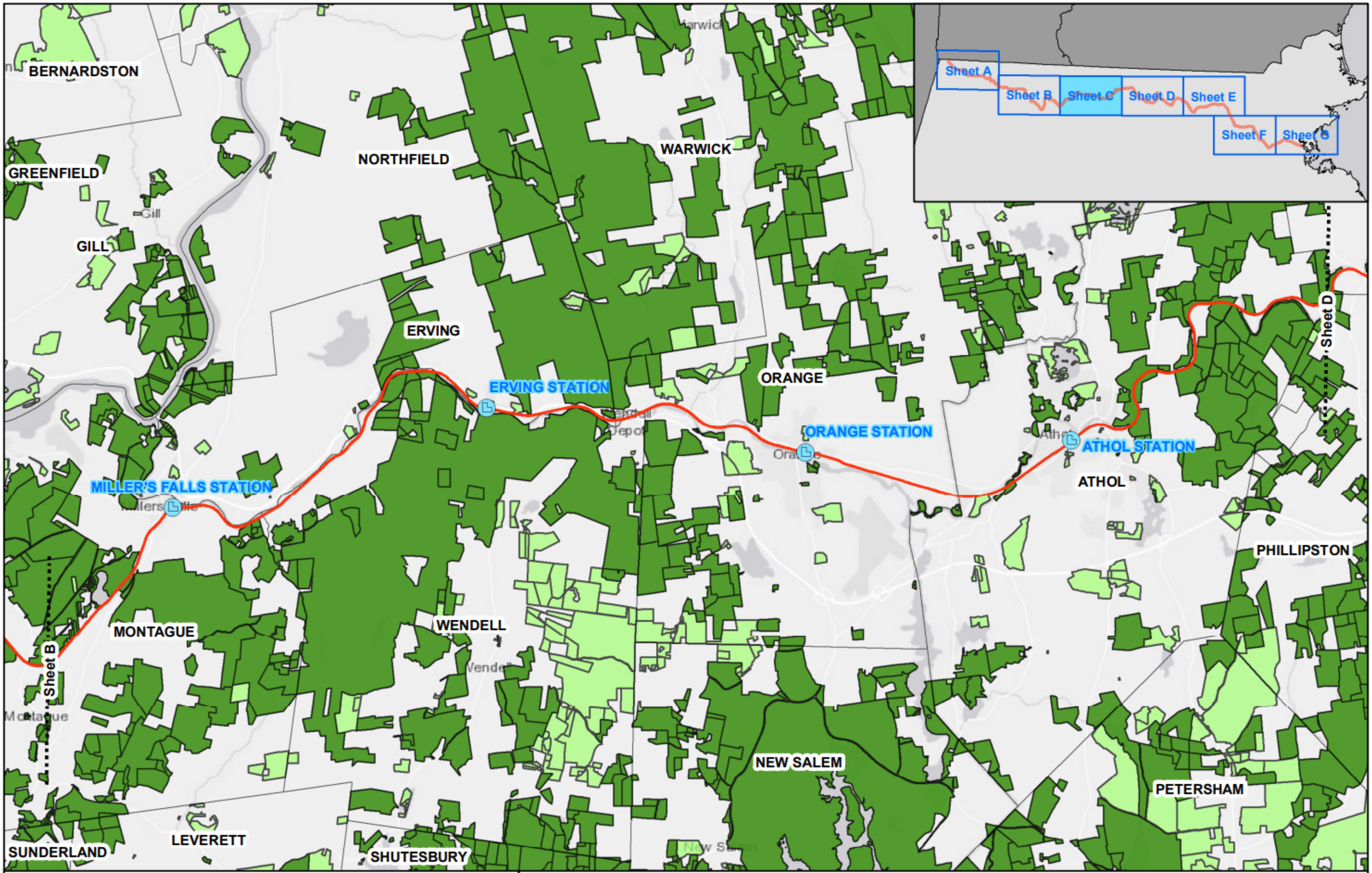

Protected Open Space

MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet C

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓛ Rail Station

— OTS Northern Tier Railline

🟩 Article 97 Properties

🟩 Protected Open Space

☐ Town Boundary

0 1 2 3 4 5 Miles

N

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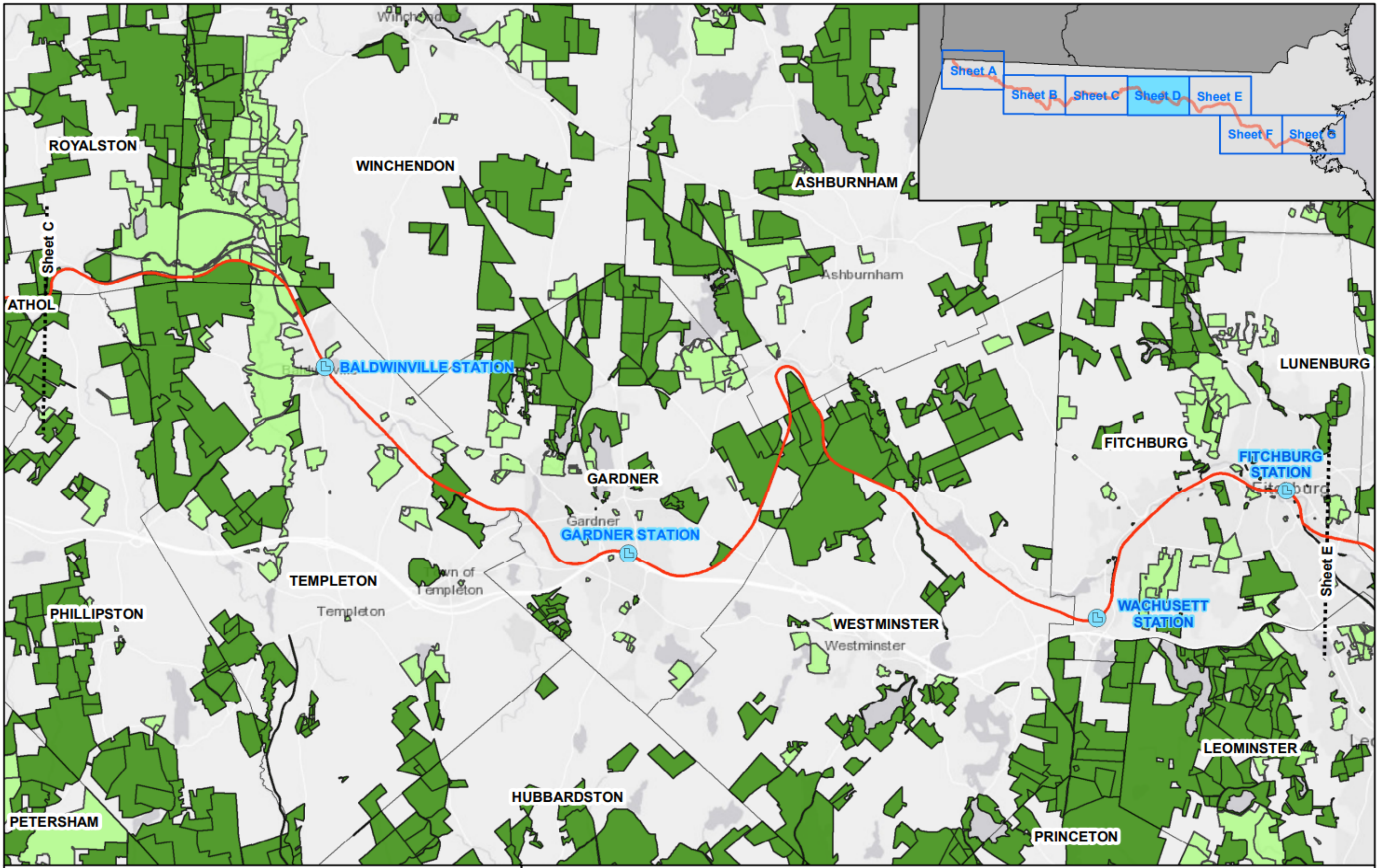

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MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet D

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- ◎ Rail Station
- ― OTS Northern Tier Railline
- 🟩 Article 97 Properties
- 🟩 Protected Open Space
- ☐ Town Boundary

Note:
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0 1 2 3 4 5 Miles

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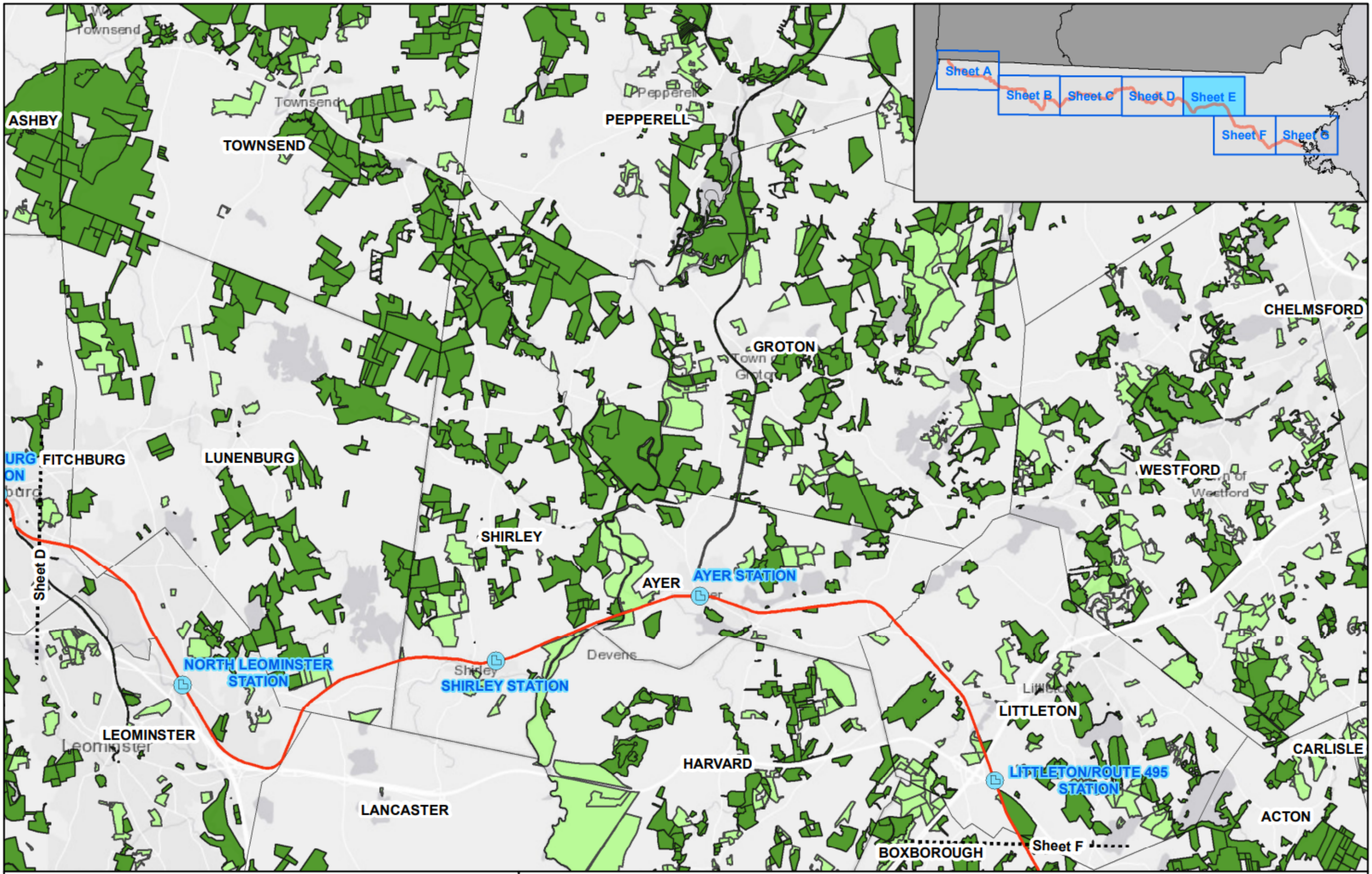


Protected Open Space

MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet E

HNTB massDOT Massachusetts Department of Transportation

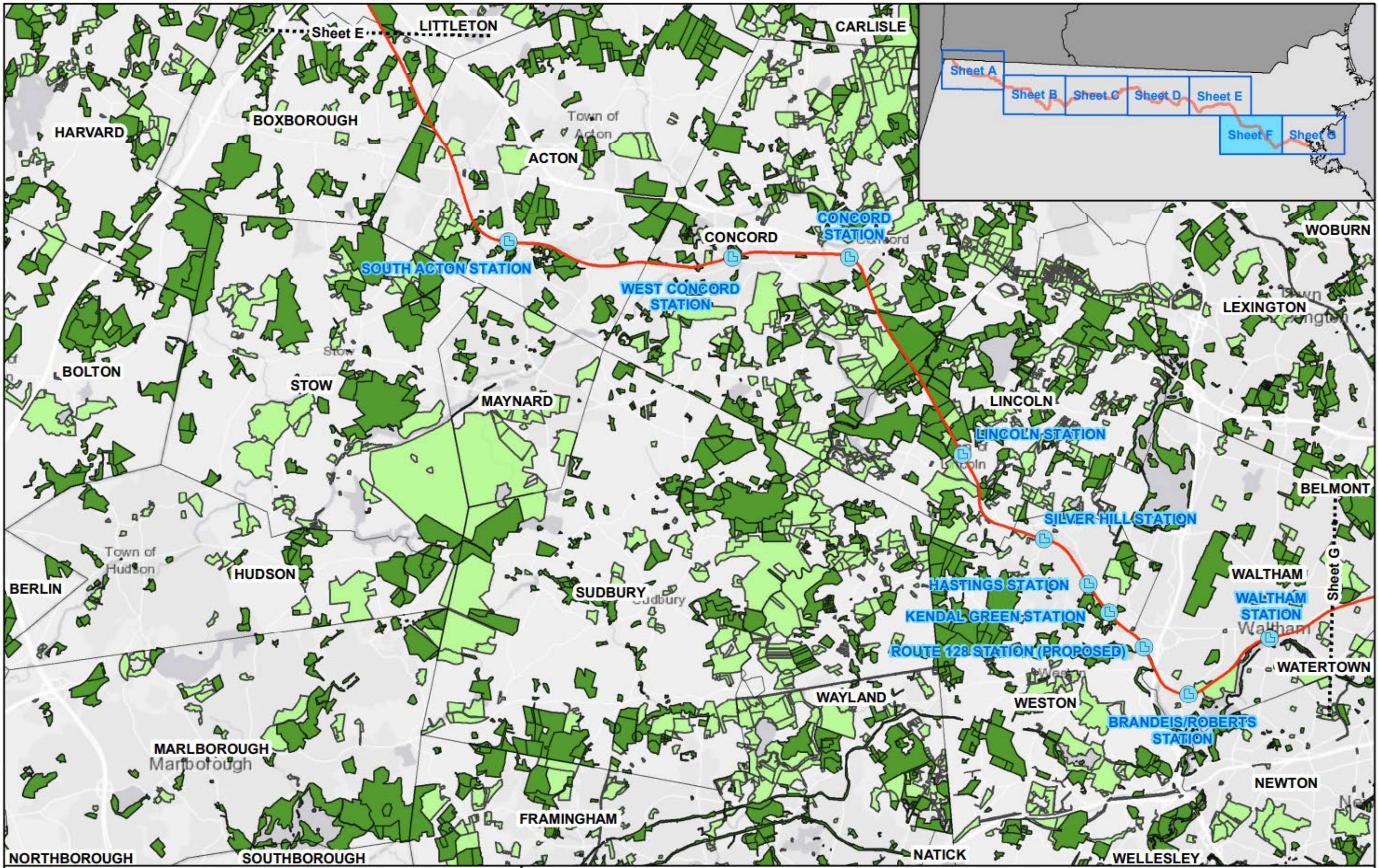
Boston, MA

March 2022

Legend

Ⓑ	Rail Station
—	OTS Northern Tier Railline
🟩	Article 97 Properties
🟩	Protected Open Space
☐	Town Boundary

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.



Protected Open Space

MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet F

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- ◉ Rail Station
- — OTS Northern Tier Railline
- 🟩 Article 97 Properties
- 🟩 Protected Open Space
- ☐ Town Boundary

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

0 1 2 3 4 5 Miles

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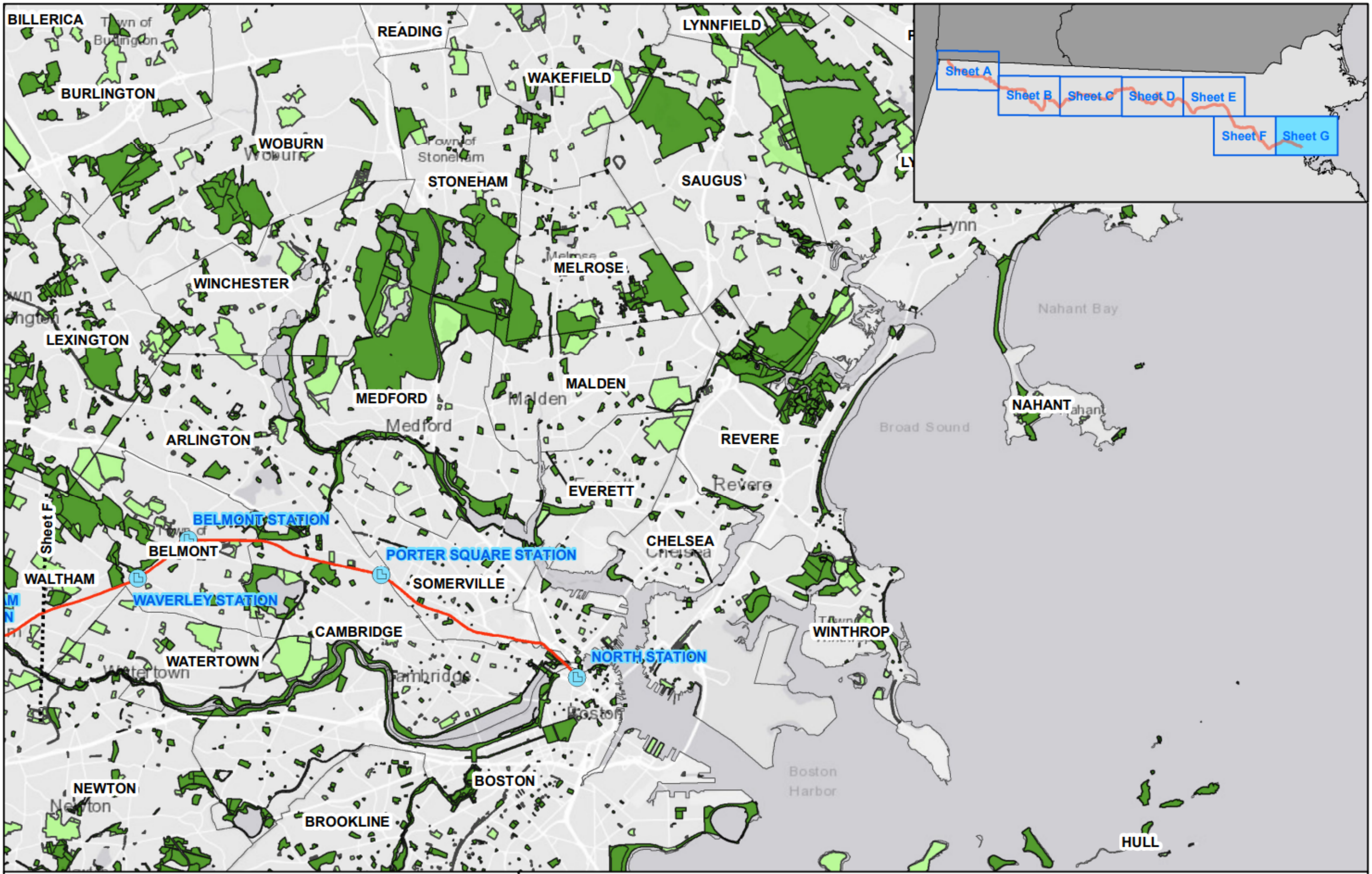

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MassDOT Northern Tier Passenger Rail Study

Figure 5

Sheet G

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Rail Station

OTS Northern Tier Railline

🟩 Article 97 Properties

🟩 Protected Open Space

☐ Town Boundary

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

0 1 2 3 4 5 Miles

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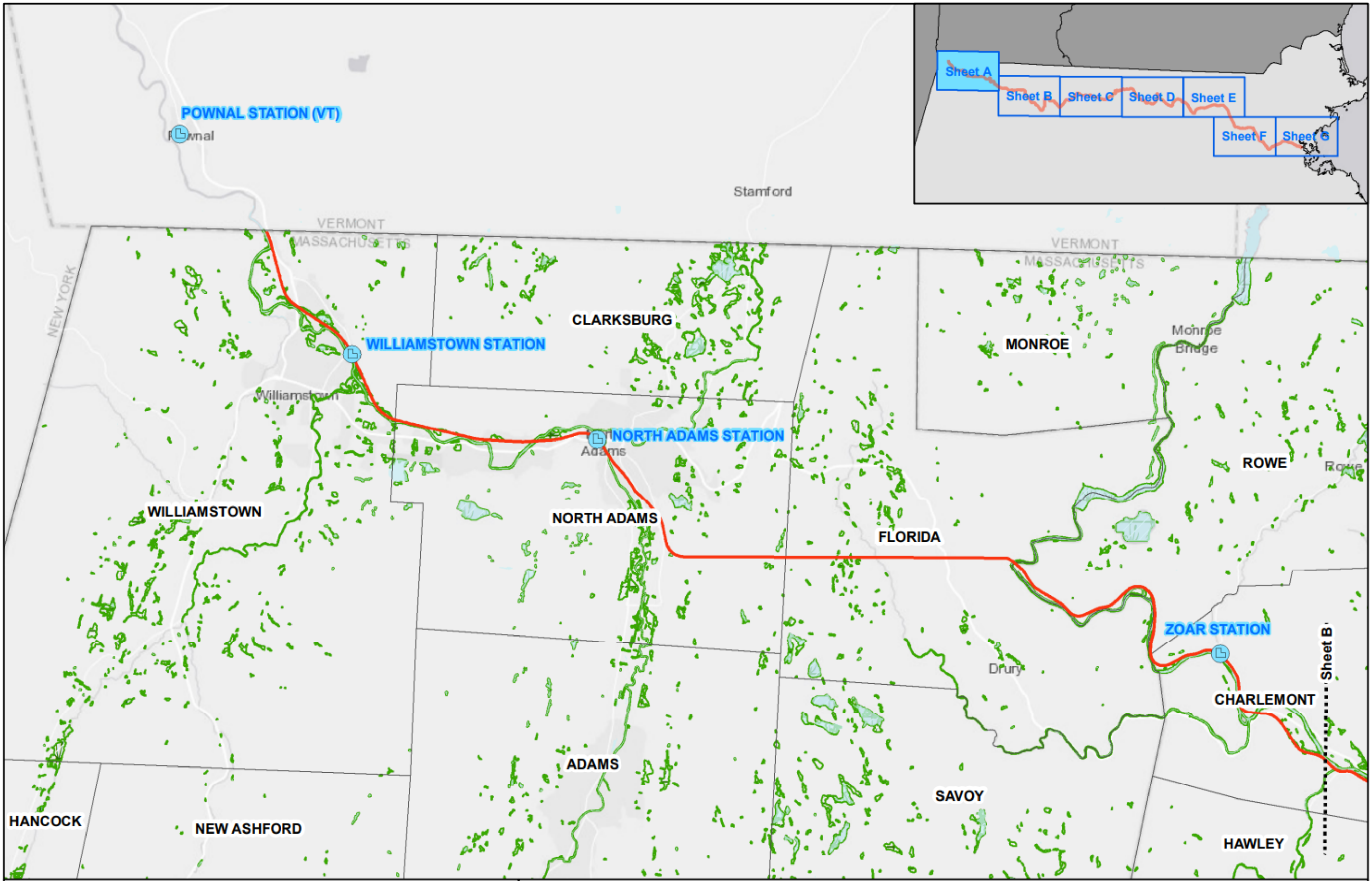

Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 2

Sheet A

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

ⓑ Rail Station	🟩 Wetland
— OTS Northern Tier Railline	☐ Town Boundary
▭ Rivers	

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

0 1 2 3 4 5 Miles

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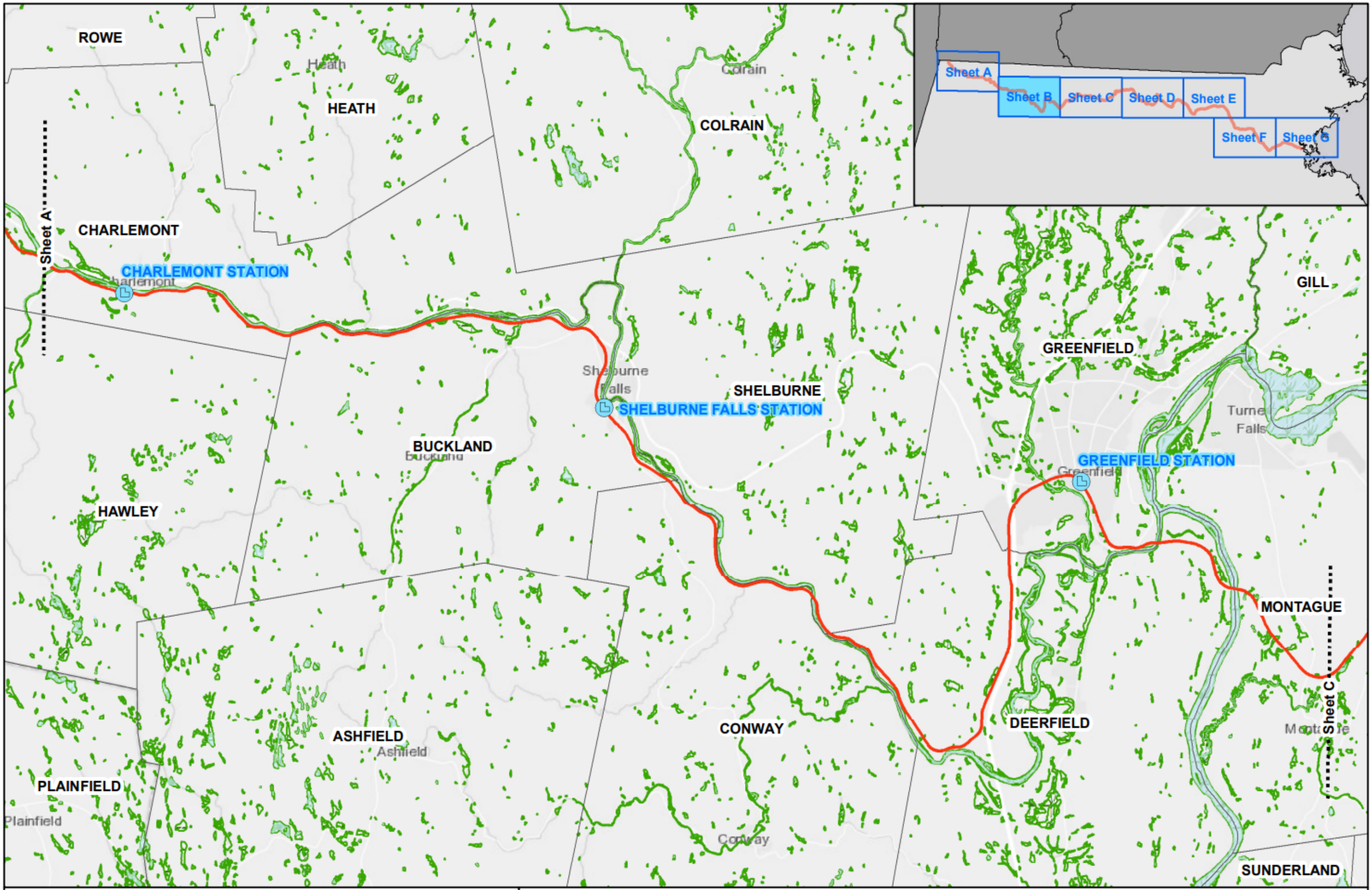


Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Legend

- Ⓑ Rail Station
- ━ OTS Northern Tier Railline
- 🟦 Rivers
- 🟩 Wetland
- ☐ Town Boundary

Figure 2

Sheet B

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

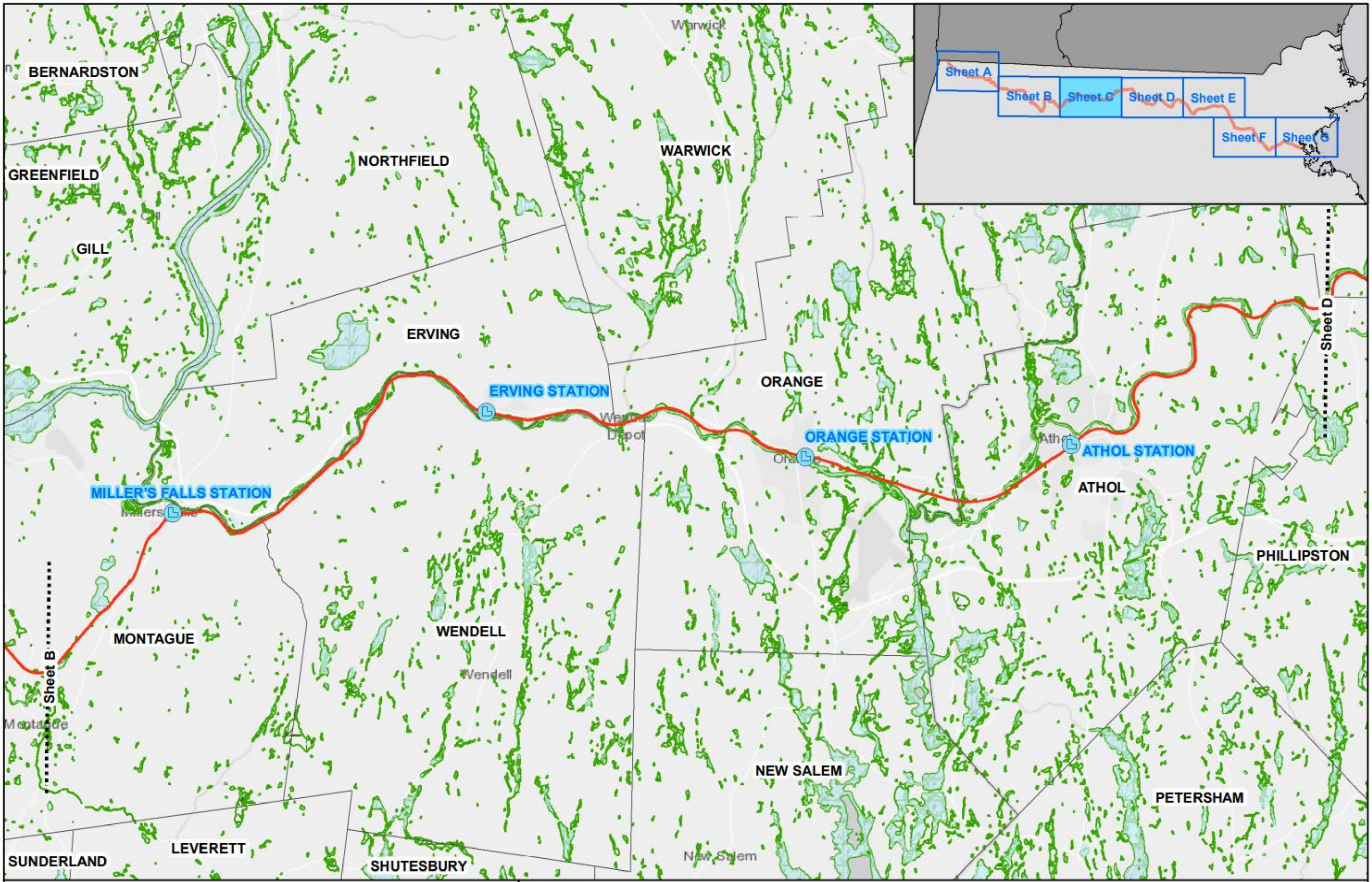
March 2022

Note:
- The railroad between North Adams and Zoar Stations is located in the Hoosac Tunnel.

0 1 2 3 4 5 Miles

N

Document Path: \\bosw00\pmwork\JOBS\79186 MassDOT OTP Northern Tier\TECHPROD\Environmental\GIS\MXD\OTS_NorthernTier_Wetland_Resources.mxd



Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 2

Sheet C

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓑ	Rail Station
—	OTS Northern Tier Railline
▨	Rivers
▨	Wetland
☐	Town Boundary

Note:
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0 1 2 3 4 5 Miles

N

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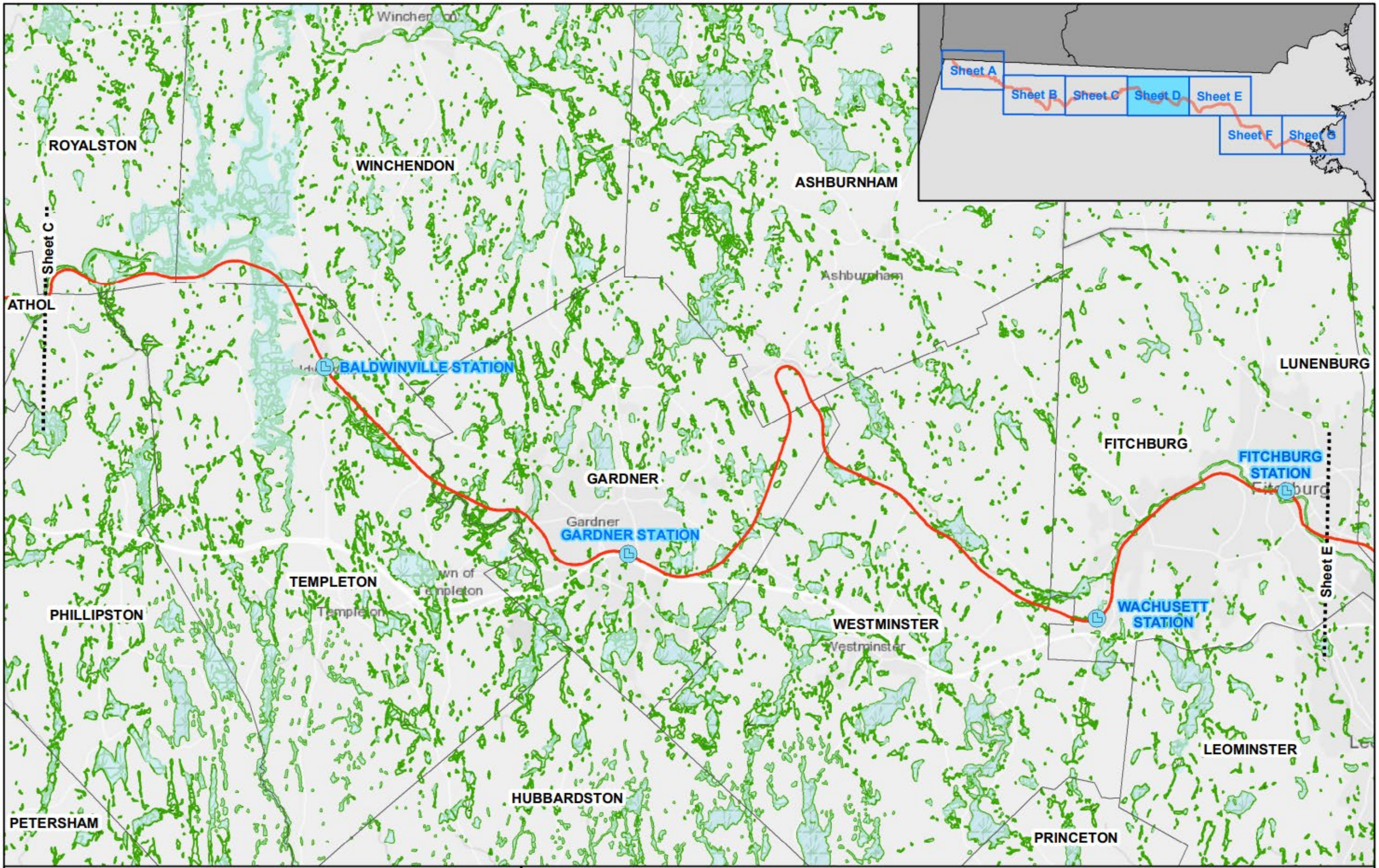

Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 2

Sheet D

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓛ	Rail Station
—	OTS Northern Tier Railline
▨	Rivers
▨	Wetland
☐	Town Boundary

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0 1 2 3 4 5 Miles

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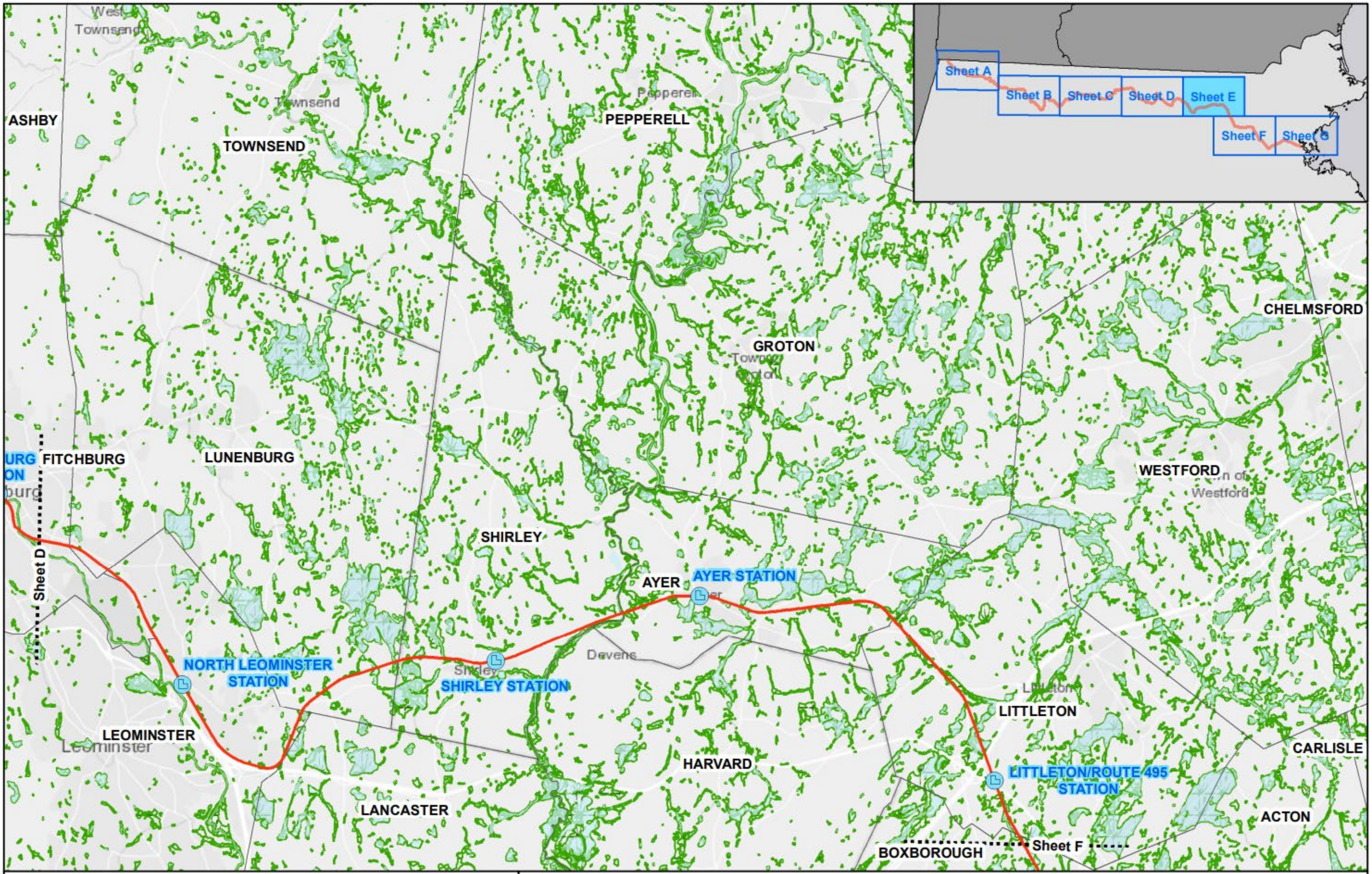

Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 2

Sheet E

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓑ Rail Station	Wetland
OTS Northern Tier Railline	Town Boundary
Rivers	

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0 1 2 3 4 5 Miles

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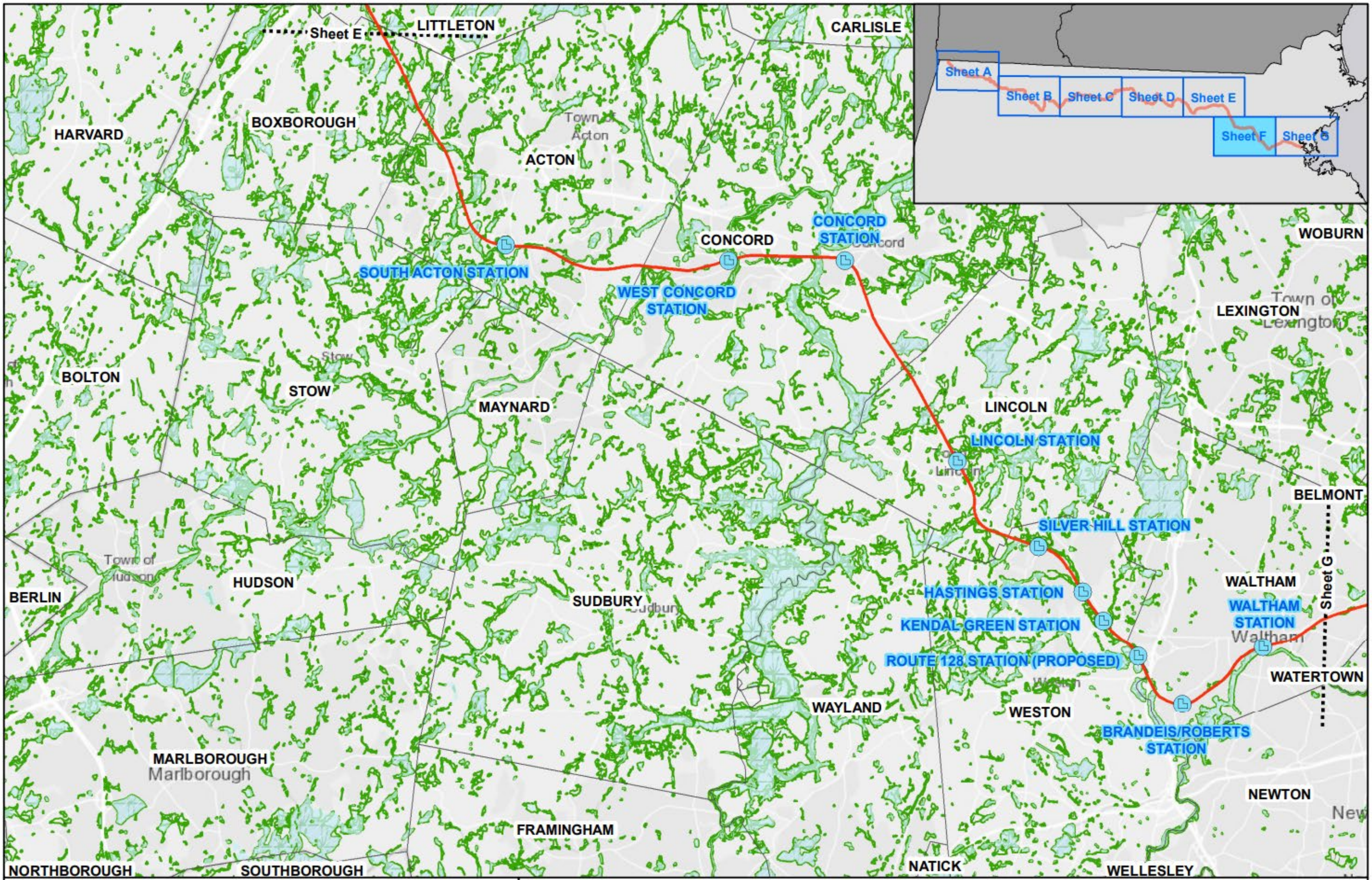

Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 2

Sheet F

HNTB massDOT Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

Ⓢ Rail Station	🟩 Wetland
— OTS Northern Tier Railline	☐ Town Boundary
🟦 Rivers	

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0 1 2 3 4 5 Miles

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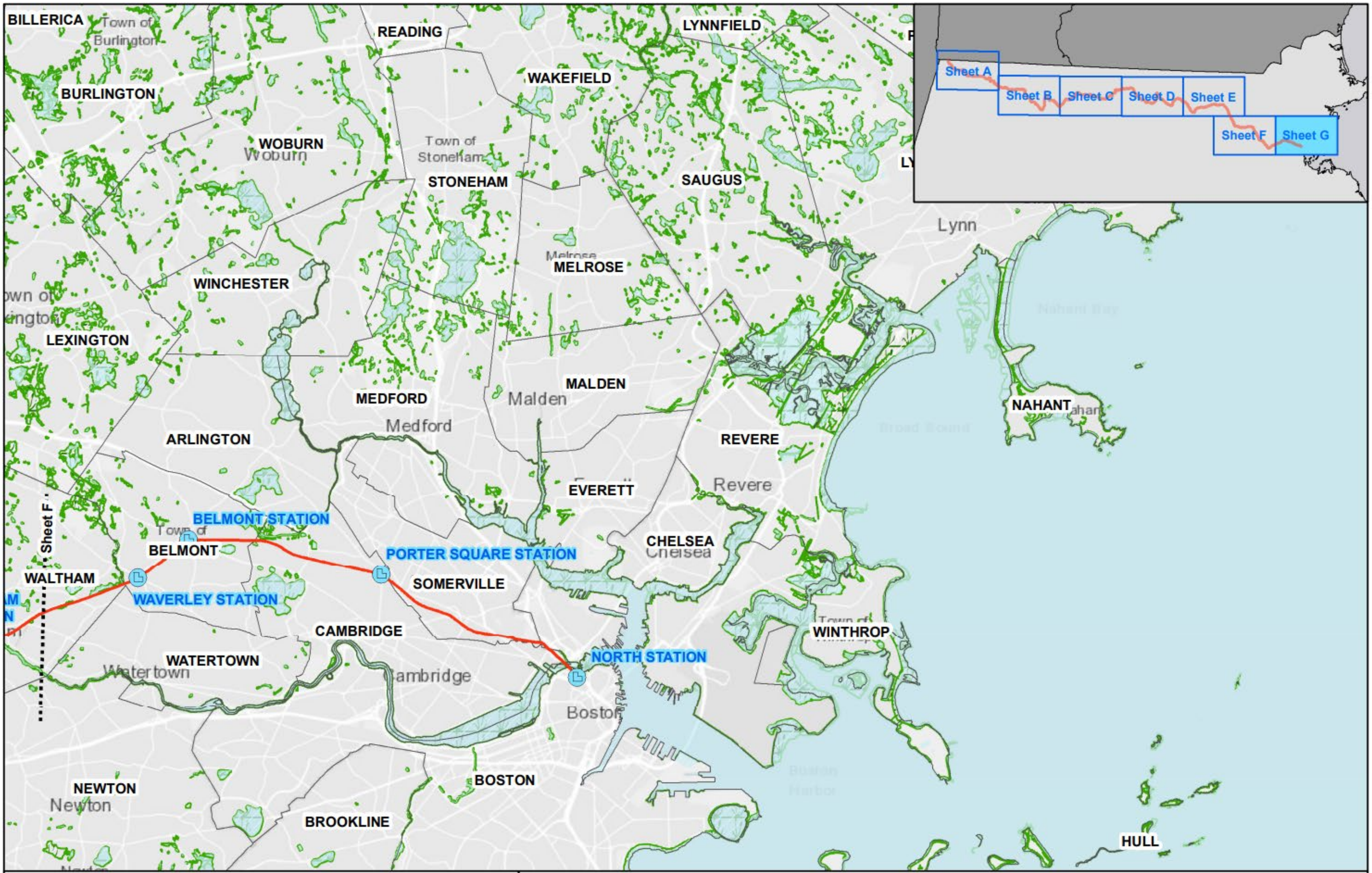

Wetland Resources Map

MassDOT Northern Tier Passenger Rail Study

Figure 2

Sheet G

HNTB massDOT
Massachusetts Department of Transportation

Boston, MA

March 2022

Legend

- Ⓑ Rail Station
- ― OTS Northern Tier Railline
- 🟦 Rivers
- ▨ Wetland
- ☐ Town Boundary

Note:
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0 1 2 3 4 5 Miles

N

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Appendix D

Ridership Methodology

CAMBRIDGE
SYSTEMATICS
Think Forward

Memorandum

TO: Northern Tier Passenger Rail Project Team

FROM: Cambridge Systematics

DATE: September 26, 2023

RE: **Northern Tier Passenger Rail Ridership Estimation**

The purpose of this memo is to outline the data, processes, and assumptions used to develop the ridership forecast for the Northern Tier Passenger Rail (NTPR) service alternatives. This memo supersedes the previous ridership memo for the initial two alternatives. The ridership estimates presented here are for the initial two baseline scenarios plus four additional alternatives.

Alternatives

Six service alternatives have been defined for the Northern Tier passenger rail service, which parallels Route 2 across the Commonwealth. Table 1 lists the alternatives and their specific characteristics. Each proposed alternative would utilize the Pan Am Southern LLC (PAS) line between Mechanicville, NY, North Adams, MA, and Fitchburg, MA, then onward to Boston North Station via trackage owned by the MBTA. Key differences between the various scenarios include travel times and stations served. In addition, one scenario entails a transfer between Northern Tier and MBTA commuter trains at Fitchburg.

Data

Three main data sources have been used to forecast ridership for the various alternatives. These sources are:

- **MBTA Commuter Rail Service**: MBTA Commuter rail station-level boarding data, frequency of service, travel time, and distance to Boston by station tracts for the period March to April 2018.

- **StreetLight Location-Based Services (LBS)**: Anonymous cellphone and geographic data processed to develop origin-destination trips between groups of census tracts for the period March to April 2019 and September to October 2019.

- **Amtrak *Downeaster***: Origin-Destination passenger volumes, service characteristics, distances for the 2019 calendar year.

Table 1 List of Alternatives

Alternative	Stops	Electrified	Trips per direction	Maximum Speeds[1]
1 – Lower Investment	North Adams, Greenfield, Fitchburg, North Station	No	5 per day	60/80 mph
2 – Higher Investment	North Adams, Greenfield, Fitchburg, North Station	No	5 per day	60/80 mph
3 – Electrified Service	North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter Square, North Station	Yes	5 per day	60/80 mph
4 – Full Local Service	North Adams, Shelburne Falls, Greenfield, Athol, Gardner, Fitchburg, Porter Square, North Station	No	5 per day	60/80 mph
5 – Albany Extension / Albany Connector	Albany (NY), North Adams, Greenfield, Fitchburg, Porter Square, North Station	No	5 per day	60/80 mph
6 – North Adams to Fitchburg With Well-Synchronized Transfer Between MBTA Commuter Rail and Northern Tier at Fitchburg	North Adams, Greenfield, Athol, Fitchburg (connection to MBTA)	No	5 per day	60/80 mph

Model Estimation

The commuter rail boarding model first estimates the number of boardings at each station along the proposed Northern Tier Passenger Rail line using linear regression (see Appendix B). It estimates the number of daily boardings at each station based on the average daily LBS trips to Boston and the ratio of transit to auto travel time to Boston. For this model, each station's rail and auto travel time ratio was used as a data point in the estimation process. This ratio is further discussed later in the memo, under the heading *Ratio of transit to auto travel time to Boston*. The regression model was developed using the existing MBTA commuter rail boarding data. Due to the longer travel time to Boston for the NTPR service, MBTA stations with a less than 45-minute travel time to Boston were excluded from the model estimation dataset. These stations often compete with MBTA subway service and are not similar in characteristics (such as distance to Boston and population density) to the proposed NTPR stations due to their proximity to Boston. The stations that were used to estimate the boarding model include twelve commuter rail lines and 36 stations.

Effect of service frequency on number of boardings was then accounted for by adjusting the modeled boardings based on headway elasticity.

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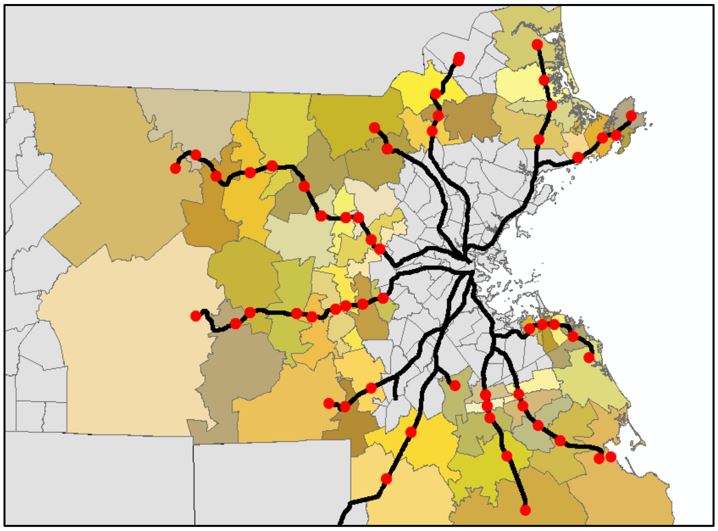
[1] The corridor has a maximum speed of 79 mph in the MBTA territory and 60 mph in the Pan Am Southern territory across all six alternatives.

Average daily LBS trips to Boston

The LBS data provide information on the number of trips that are currently being made in the service area. This number of trips serves as an estimate of the travel market that is being served by the MBTA. For developing the NTPR estimation model, the LBS data was aggregated to catchment areas for each of the MBTA commuter rail stations. The catchment area for each of the MBTA commuter rail stations was determined by using the straight-line distance from the U.S. Census Tract geography centroid, to/from the nearest station. The tract geography was then aggregated to a full catchment area for each station as shown in Figure 1.

Figure 1 MBTA Commuter Rail Catchment Areas



Total trips between each MBTA catchment area and Boston captures characteristics of the catchment area such as total population and distance to Boston. The higher the population in the catchment area and the closer to Boston a station would be correlated with higher total trips. Therefore these additional variables were not included directly in the model. As expected, the regression model has a positive relationship between total trips and boardings at the station.

Ratio of transit to auto travel time to Boston

For each of the MBTA stations the ratio of average transit travel time to auto travel time to Boston was calculated. This variable captures how well transit can compete with auto as an attractive mode for travel to Boston. Ratios below one indicate that train travel takes less time than traveling by auto. Ratios above one indicate that auto travel is faster than train travel. In the estimated regression model, the lower the ratio, the greater the estimated number of boardings.

Headway Elasticity: Adjusting for Service Frequency

Passenger rail service attracts more riders as the frequency of service increases. We did not include service frequency in the Commuter Rail Boarding model because commuter rail service is much more frequent than the proposed NTPR line. With MBTA commuter rail service, 7 to 10 trains are dispatched in each direction during morning hours – about 15 to 20 trains per direction daily. Including service frequency in the boarding model works well at the estimation stage, with a statistically significant parameter, however its application to NTPR would be unsuitable as it would require extrapolation far outside of the observed data.

One way to capture the effect of service frequency is to use what is called "Headway Elasticity" on the MBTA model outputs. Headway elasticity is a measure of how changes in transit frequency affects transit ridership. According to the literature, elasticity of ridership to service expansion, including having more frequent trains, is typically between 0.6 and 1.0[2]. It means that each 1% increase in transit supply (vehicle-miles or -hours) increases ridership by 0.6 to 1.0%. Multiple factors influence headway elasticity, some of which are type of service, land use, and connection to other transit services with transfers. After considering the characteristics of the proposed NTPR service, it was decided to use a value of 1.00 for the headway elasticity.

NTPR is assumed to run 2 trains per direction between 6 and 10 AM. In the dataset used for fitting the Commuter Rail Boarding model, average MBTA train frequency during those hours is 8.85, which is calculated based on a total of 425 inbound trains of 12 different commuter lines during the 4-hour morning period. Outputs of the Commuter Rail Boarding model would work well if NTPR ran 8 or 9 inbound trains between 6 and 10 AM. However, because NTPR will run fewer trains than MBTA commuter rail, with headway elasticity equal to 1.00, output of the MBTA boarding model should be adjusted. As an example, the adjustment factor for stations that will not be served by both MBTA commuter rail and NTPR is 0.226.

$$\text{(Headway Elasticity)} * \text{(NTPR Freq / MBTA Freq)} = \text{Headway Adjustment Factor}$$

$$(1.00) * (2 / 8.85) = 0.226$$

Headway adjustment factors for individual stations are presented in Appendix B.

Model Application

The Commuter Rail Boarding Model was used to estimate the total boardings at each of the NTPR stations for each alternative.

Average daily LBS trips to Boston

The model uses the LBS data of March, April, September, and October months in 2019 to estimate the total volume of trips from station catchment areas to the Boston area. The "Boston" catchment area is comprised of North Station and Porter Square. North Station destination communities include Boston, Cambridge, Brookline, Chelsea, Everett, and Somerville. Porter Square destination communities include Arlington, Belmont, and Medford. The average daily trips from the NTPR stations to the Boston area are shown in Table 2.

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[2] John E. Evans (2004), "Transit Scheduling and Frequency," Traveler Response to Transportation System Changes, TCRP Report 95.

Table 2 LBS Average Daily Trips from Catchment Areas to Boston Area by Alternative

Alternative	Station Catchment Area	Porter Square	North Station	Total Boston Area
1 – Lower Investment *	NORTH ADAMS	N.A.	58	58
	GREENFIELD	N.A.	184	184
	FITCHBURG	N.A.	193	193
2 – Higher Investment *	NORTH ADAMS	N.A.	58	58
	GREENFIELD	N.A.	184	184
	FITCHBURG	N.A.	193	193
3 – Electrified Service	NORTH ADAMS	2	58	60
	GREENFIELD	23	159	182
	ATHOL / ORANGE	32	236	268
	FITCHBURG	14	196	210
	AYER	24	229	253
4 – Full Local Service	NORTH ADAMS	2	54	56
	SHELBURNE FALLS	1	18	19
	GREENFIELD	23	157	180
	ATHOL / ORANGE	32	234	266
	GARDNER	78	660	738
	FITCHBURG	14	196	210
5 –Albany Extension / Albany Connector	ALBANY	-	20	20
	NORTH ADAMS	2	59	61
	GREENFIELD	25	189	214
	FITCHBURG	14	196	210
6 – North Adams to Fitchburg With Transfer Between MBTA Commuter Rail and NTPR at Fitchburg	NORTH ADAMS	2	58	60
	GREENFIELD	23	158	181
	ATHOL / ORANGE	32	234	266
	FITCHBURG	14	196	210

* The “Lower Investment” and “Higher Investment” station areas are identical, and therefore the LBS average daily trips from the station catchment areas are also identical.

Rail vs auto travel time to Boston

LBS data provided by StreetLight includes trip travel times. Because western Massachusetts’ communities along the NTPR are presently do not have effective public transportation options for travel to Boston, LBS data exclusively represents auto travel time. NTPR transit travel times to Boston are listed in Table 3. For more context, travel times for Amtrak’s *Lake Shore Limited* are also presented. For this comparison, each of the NTPR stops was paired with a *Lake Shore Limited* stop with similar distance to Boston. NTPR stops that did not have an equivalent stop on the *Lake Shore Limited’s* route were left blank.

Table 3 List of Travel Times to Boston (Hours:Minutes)

	NTPR		*Lake Shore Limited*	
Alternative	**Station Catchment Area**	**Run Time to Boston**	**Corresponding Station**	**Run Time to Boston**
1 – Lower Investment	NORTH ADAMS	3:55	Pittsfield	3:56
	GREENFIELD	2:36	Springfield	2:20
	FITCHBURG	1:02	Worcester	0:56
2 – Higher Investment	NORTH ADAMS	2:48	Pittsfield	3:56
	GREENFIELD	2:01	Springfield	2:20
	FITCHBURG	0:58	Worcester	0:56
3 – Electrified Service	NORTH ADAMS	2:50	Pittsfield	3:56
	GREENFIELD	2:03	Springfield	2:20
	ATHOL / ORANGE	1:36	N.A.	N.A.
	FITCHBURG	0:58	Worcester	0:56
	AYER	0:43	N.A.	N.A.
4 – Full Local Service	NORTH ADAMS	2:59	Pittsfield	3:56
	SHELBURNE FALLS	2:26	N.A.	N.A.
	GREENFIELD	2:08	Springfield	2:20
	ATHOL / ORANGE	1:40	N.A.	N.A.
	GARDNER	1:19	N.A.	N.A.
	FITCHBURG	0:58	Worcester	0:56
5 – Albany Extension / Albany Connector	ALBANY	4:33	Albany-Rensselaer	4:57
	NORTH ADAMS	2:49	Pittsfield	3:56
	GREENFIELD	2:01	Springfield	2:20
	FITCHBURG	0:58	Worcester	0:56
6 – North Adams to Fitchburg With Transfer Between MBTA Commuter Rail and NTPR at Fitchburg	NORTH ADAMS	3:21	Pittsfield	3:56
	GREENFIELD	2:34	Springfield	2:20
	ATHOL / ORANGE	2:06	N.A.	N.A.
	FITCHBURG	1:28	Worcester	0:56

Model Results

The estimated model was utilized to project average boardings for a potential NTPR service at each of the stations across the six alternatives. For each station, the baseline boarding estimate is also accompanied by lower- and upper-bound boarding estimates. These values correspond to higher and lower boarding estimates of the MBTA boarding model according to the 95% confidence interval of the model parameters.

Boarding results from the model are summarized in Table 4. Values shown are forecast lower-bound, average, and upper-bound annual boardings by station for each of the NTPR service alternatives. Every boarding and its associated alighting is considered one rider. Thus, ridership is defined as the sum of boardings at all NTPR stations.

Higher ridership in alternative 2 with higher investment, compared to alternative 1, is due to shorter travel times. Among the six alternatives examined, the highest ridership is achieved in alternative 3 due to a combination of faster travel times resulting from electrified service and two additional stops at Athol/Orange and Ayer. In alternative 4, gains from these two additional station stops are offset by longer travel times associated with diesel rather than electric operation.

Serving Albany in alternative 5 also yields a higher ridership than alternative 1. One implication of this model result is that, with extending NTPR to Albany, there will be about 7 to 11 trips just between Albany and Boston every day – in both directions[3], excluding those made via Amtrak's *Lake Shore Limited*.

The last alternative, 6, requires almost half of the NTPR passengers to transfer at Fitchburg to continue on to North Station/Boston and vice versa. More specifically, those who travel between NTPR stations west of Fitchburg and stations east of Fitchburg would be required to transfer between NTPR and MBTA commuter rail. By using MBTA commuter rail, travelers incur a 30-minute increase in travel time between Fitchburg and Boston over the NTPR service, plus additional dwell time at Fitchburg awaiting connecting trains and the physical inconvenience associated with having to transfer between trains. To reflect these impacts, 10 minutes transfer penalty and 5 minutes wait time were added to the travel time for such passengers. These values reflect a well-synchronized transfer at Fitchburg to a degree that, while common in Europe, is rare in the US. Nonetheless, the model shows that the transfer and associated substantial increase in travel time is unfavorable and severely impacts the attractiveness of the service to potential users.

Table 5 contrasts ridership at Massachusetts stations of Amtrak's *Lake Shore Limited* long-distance train against that of NTPR Alternative 1. In the chart, each station on NTPR is matched with an LSL station that has a similar distance to Boston as the NTPR counterpart. The LSL and NTPR routes parallel each other across the state approximately 50 miles apart, with the former route roughly paralleling the Massachusetts Turnpike. The daily LSL links Amtrak's Chicago hub with Boston, providing direct service to many more markets (21), and with a far larger population base. That includes service to Worcester and Springfield, the Commonwealth's second and third largest cities, respectively.

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[3] The estimate for Albany only includes traffic associated with the Albany region due to geographic limitations of the StreetLight data used for this study. It thus does not include potential connecting traffic from other regions such as the New York metropolitan region.

Table 4 Alternatives Projected Annual Boardings – Inbound and Outbound

Alternative	Stations	Annual NTPR Boardings, Balanced			
		Lower Bound	Average	Upper Bound	Range
1 – Lower Investment	NORTH ADAMS	590	860	1,130	590 - 1,130
	GREENFIELD	4,370	6,540	8,720	4,370 - 8,720
	FITCHBURG	29,710	39,260	48,810	29,710 - 48,810
	BOSTON	31,210	42,000	52,800	31,210 - 52,800
	TOTAL RIDERSHIP	65,880	88,660	111,460	**65,880 - 111,460**
2 – Higher Investment	NORTH ADAMS	9,730	10,690	11,660	9,730 - 11,660
	GREENFIELD	11,890	13,870	15,850	11,890 - 15,850
	FITCHBURG	31,430	40,960	50,500	31,430 - 50,500
	BOSTON	47,730	58,960	70,190	47,730 - 70,190
	TOTAL RIDERSHIP	100,780	124,480	148,200	**100,780 - 148,200**
3 – Electrified Service	NORTH ADAMS	9,390	10,420	11,440	9,390 - 11,440
	GREENFIELD	11,300	13,300	15,290	11,300 - 15,290
	ATHOL / ORANGE	14,310	17,130	19,940	14,310 - 19,940
	FITCHBURG	32,260	42,260	52,270	32,260 - 52,270
	AYER	36,170	48,680	61,180	36,170 - 61,180
	BOSTON	93,090	118,590	144,080	93,090 - 144,080
	TOTAL RIDERSHIP	196,520	250,380	304,200	**196,520 - 304,200**
4 – Full Local Service	NORTH ADAMS	6,640	7,270	7,920	6,640 - 7,920
	SHELBURNE FALLS	6,410	6,700	6,950	6,410 - 6,950
	GREENFIELD	10,440	12,530	14,620	10,440 - 14,620
	ATHOL / ORANGE	13,520	16,460	19,370	13,520 - 19,370
	GARDNER	19,840	27,260	34,660	19,840 - 34,660
	FITCHBURG	31,600	41,270	50,950	31,600 - 50,950
	BOSTON	79,590	100,290	120,990	79,590 - 120,990
	TOTAL RIDERSHIP	168,040	211,780	255,460	**168,040 - 255,460**
5 –Albany Extension / Albany Connector	ALBANY	1,570	1,970	2,350	1,570 - 2,350
	NORTH ADAMS	8,550	9,270	9,980	8,550 - 9,980
	GREENFIELD	11,780	13,990	16,200	11,780 - 16,200
	FITCHBURG	30,920	40,460	49,980	30,920 - 49,980
	BOSTON	47,520	59,090	70,650	47,520 - 70,650
	TOTAL RIDERSHIP	100,340	124,780	149,160	**100,340 - 149,160**
6 – North Adams to Fitchburg With Transfer Between MBTA Commuter Rail and NTPR at Fitchburg	NORTH ADAMS	70	480	1,140	70 - 1,140
	GREENFIELD	310	2,190	4,090	310 - 4,090
	ATHOL / ORANGE	1,620	4,320	7,030	1,620 - 7,030
	FITCHBURG, Outbound	90	350	620	90 - 620
	Transfer from MBTA Commuter to NTPR at FITCHBURG	1,810	6,300	11,020	1,810 - 11,020
	TOTAL RIDERSHIP	3,900	13,640	23,900	**3,900 - 23,900**

Table 5 Comparison Between NTPR Projected Annual Boardings and Lake Shore Limited Rail Boardings

Alternative	**Station**	**Average Annual Boardings**	
		NTPR Estimate	**Lake Shore Limited** Corresponding Station: Ridership in 2019
1 – Lower Investment	NORTH ADAMS	860	Pittsfield: 8,930
	GREENFIELD	6,540	Springfield: 17,160
	FITCHBURG	39,260	Worcester: 6,510
Sum		**46,660**	**32,600**
2 – Higher Investment	NORTH ADAMS	10,690	Pittsfield: 8,930
	GREENFIELD	13,870	Springfield: 17,160
	FITCHBURG	40,960	Worcester: 6,510
Sum		**65,520**	**32,600**
3 – Electrified Service	NORTH ADAMS	10,420	Pittsfield: 8,930
	GREENFIELD	13,300	Springfield: 17,160
	ATHOL / ORANGE	17,130	N.A.
	FITCHBURG	42,260	Worcester: 6,510
	AYER	48,680	N.A.
Sum		**131,790**	**N.A.**
4 – Full Local Service	NORTH ADAMS	7,270	Pittsfield: 8,930
	SHELBURNE FALLS	6,700	N.A.
	GREENFIELD	12,530	Springfield: 17,160
	ATHOL / ORANGE	16,460	N.A.
	GARDNER	27,260	N.A.
	FITCHBURG	41,270	Worcester: 6,510
Sum		**111,490**	**N.A.**
5 –Albany Extension / Albany Connector	ALBANY	1,970	Albany-Rensselaer: 78,040
	NORTH ADAMS	9,270	Pittsfield: 8,930
	GREENFIELD	13,990	Springfield: 17,160
	FITCHBURG	40,460	Worcester: 6,510
Sum		**65,690**	**110,640**
6 – North Adams to Fitchburg (Connect to MBTA Fitchburg Line)	NORTH ADAMS	480	Pittsfield: 8,930
	GREENFIELD	2,190	Springfield: 17,160
	ATHOL / ORANGE	4,320	N.A.
	FITCHBURG	6,650	Worcester: 6,510
Sum		**13,640**	**N.A.**

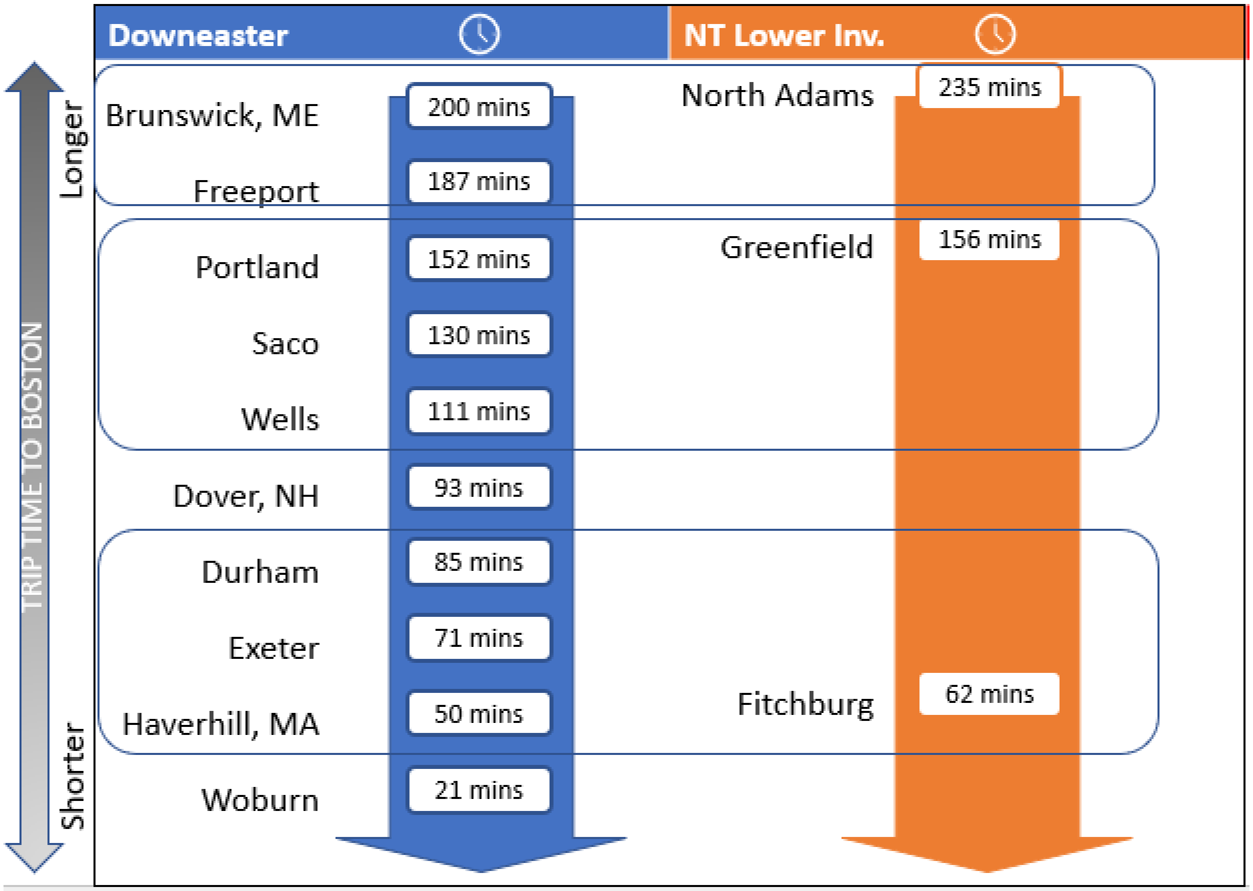
Intra-Corridor Trips

The boarding model predicts the number of boardings at each of the proposed stations. To predict trips between emistations, they need to be distributed (e.g., North Adams to Greenfield). To do so, recent travel patterns on the Downeaster service were analyzed and applied to the

NTPR stations. The Downeaster service has Boston as its anchor destination and similar to the commuter rail system is oriented for travel to Boston. Inter-station trips on the Downeaster are about 22 percent of total trips to Boston. Due to different population densities between areas that Downeaster serves along the New Hampshire and Maine coastal region, as opposed to more farther spaced NTPR stations, non-Boston inter-station trips on NTPR were estimated to be 10 percent of total trips. The 10% number represents a reasonable estimate of the intrazonal trips. This number is based, in part, on the distances between each line's train stations. The Downeaster service contains 11 stations with an average distance between stations of 20 minutes. The NTPR service has from 4 to 8 stations depending on the alternative. The average travel time for these stations ranges from 78 minutes (Alternative 1) to 30 minutes (Alternative 4).

This process involved identifying Downeaster stations that entailed similar travel times to Boston and, for these stations, non-Boston stations that had similar travel times as non-Boston NTPR stations. Figure 2 shows the grouping of Downeaster to NTPR stations based on travel times for Alternative 1.

Figure 2 Sample Downeaster to Northern Tier Railroad Travel Time Groupings



Travel times to Downeaster non-Boston stations for the NTPR similar stations were reviewed to find non-Boston (intra-corridor) stations that have comparable travel times for each of the NTPR stations and the like Downeaster stations across all alternatives. Table 6 shows the alternatives with their stations along the NTPR and the corresponding Downeaster station used for intra-corridor allocation, with station's travel time to Boston. More detailed information on the origin and destination pairing of the NTPR and Downeaster is located in Appendix C.

Table 6 Downeaster Surrogate Stations for Intra-Corridor Trip Processing

Alternative	NTPR		Downeaster	
	Time	Station	Time	Station
1 – Lower Investment	235	North Adams	200	Brunswick
	156	Greenfield	152	Portland
	62	Fitchburg	71	Exeter
2 – Higher Investment	168	North Adams	152	Portland
	121	Greenfield	130	Saco
	58	Fitchburg	50	Haverhill
3 – Electrified Service	170	North Adams	187	Freeport
	123	Greenfield	130	Saco
	97	Athol/Orange	93	Dover
	60	Fitchburg	50	Haverhill
	44	Ayer	50	Haverhill
4 – Full Local Service	179	North Adams	187	Freeport
	147	Shelburne Falls	152	Portland
	129	Greenfield	130	Saco
	101	Athol/Orange	93	Dover
	80	Gardner	85	Durham
	59	Fitchburg	50	Haverhill
5 –Albany Extension / Albany Connector	274	Albany	200	Brunswick
	169	North Adams	152	Portland
	121	Greenfield	130	Saco
	59	Fitchburg	50	Haverhill
6 –North Adams to Fitchburg With Transfer Between MBTA and Northern Tier at Fitchburg	202	North Adams	200	Brunswick
	154	Greenfield	152	Portland
	126	Athol/Orange	130	Saco
	88	Fitchburg	85	Durham

The trips are allocated across the intra-corridor stations by first creating an origin-destination factor for each intra-corridor pair. This factor is determined by the number of Downeaster trips between the OD pair divided by the sum of the Downeaster origin and destination populations. This process weights the OD pair based on the number of observed trips and takes into account the differences in the OD populations.

The OD factors are multiplied by the NTPR destination population to estimate OD trips. From these OD trips the shares of trips across the NTPR intra-corridor stations are calculated and then applied to the total intra-corridor trips for each NTPR origin station to estimate the NTPR intra-corridor trips. These estimates can be found below in Table 7 through Table 12.

Table 7 Origin-Destination Estimates – Lower Investment. Total Ridership = 88,660.

Alt. 1	North Adams	Greenfield	Fitchburg	Boston	Total Boardings
North Adams	0	30	260	570	860
Greenfield	30	0	2,040	4,470	6,540
Fitchburg	260	2,040	0	36,960	39,260
Boston	570	4,470	36,960	0	42,000
Total Alightings	860	6,540	39,260	42,000	**88,660**

Table 8 Origin-Destination Estimates – Higher Investment. Total Ridership = 124,480.

Alt. 2	North Adams	Greenfield	Fitchburg	Boston	Total Boardings
North Adams	0	390	1,250	9,050	10,690
Greenfield	390	0	1,640	11,840	13,870
Fitchburg	1,250	1,640	0	38,070	40,960
Boston	9,050	11,840	38,070	0	58,960
Total Alightings	10,690	13,870	40,960	58,960	**124,480**

Table 9 Origin-Destination Estimates – Electrified Service. Total Ridership = 250,380.

Alt. 3	North Adams	Greenfield	Athol/Orange	Fitchburg	Ayer	Boston	Total Boardings
North Adams	0	140	180	450	530	9,120	10,420
Greenfield	140	0	230	580	670	11,680	13,300
Athol/Orange	180	230	0	750	870	15,100	17,130
Fitchburg	450	580	750	0	2,200	38,280	42,260
Ayer	530	670	870	2,200	0	44,410	48,680
Boston	9,120	11,680	15,100	38,280	44,410	0	118,590
Total Alightings	10,420	13,300	17,130	42,260	48,680	118,590	**250,380**

Table 10 Origin-Destination Estimates – Full Local Service. Total Ridership = 211,780.

Alt 4	North Adams	Shelburne Falls	Greenfield	Athol/Orange	Gardner	Fitchburg	Boston	Total Boardings
North Adams	0	60	100	140	230	350	6,390	7,270
Shelburne Falls	60	0	100	130	210	330	5,870	6,700
Greenfield	100	100	0	240	400	610	11,080	12,530
Athol/Orange	140	130	240	0	530	810	14,610	16,460
Gardner	230	210	400	530	0	1,360	24,530	27,260
Fitchburg	350	330	610	810	1,360	0	37,810	41,270
Boston	6,390	5,870	11,080	14,610	24,530	37,810	0	100,290
Total Alightings	7,270	6,700	12,530	16,460	27,260	41,270	100,290	**211,780**

Table 11 Origin-Destination Estimates – Albany Extension / Albany Connector. Total Ridership = 124,780.

Alt 5	Albany	North Adams	Greenfield	Fitchburg	Boston	Total Boardings
Albany	0	50	70	220	1,630	1,970
North Adams	50	0	330	1,040	7,850	9,270
Greenfield	70	330	0	1,590	12,000	13,990
Fitchburg	220	1,040	1,590	0	37,610	40,460
Boston	1,630	7,850	12,000	37,610	0	59,090
Total Alightings	1,970	9,270	13,990	40,460	59,090	**124,780**

Table 12 Origin-Destination Estimates – North Adams to Fitchburg With Transfer Between MBTA Commuter Rail and NTPR at Fitchburg. Total Ridership = 13,640.

Alt. 6	North Adams	Greenfield	Athol/Orange	Fitchburg	Transfer to Commuter Rail - Boston	Total Boardings
North Adams	0	10	30	20	420	480
Greenfield	10	0	130	110	1,940	2,190
Athol/Orange	30	130	0	220	3,940	4,320
Fitchburg	20	110	220	0	0	350
MBTA Commuter Rail Transfers	420	1,940	3,940	0	0	6,300
Total Alightings	480	2,190	4,320	350	6,300	**13,640**

Future Ridership

The ridership forecast for the year 2040 were developed based on the estimated growth in population, households, and employment within the station catchment areas. Overall ridership for each service alternative is estimated to be lower for each service alternative due to the reduction in in the population and employment forecasted for the western section of the corridor. The full 2040 forecasted ridership for each alternative is provided in Appendix D. The ridership numbers for 2040 use baseline projected socioeconomic data that does not reflect changes due to the rail service operation and as such do not include any induced demand.

Seasonality

The estimates developed in this analysis are annual, and in reality there will be seasonal fluctuations in ridership. MassDOT has seasonal adjustment factors based on traffic counts by month. These were used to estimate potential fluctuations in travel on the corridor.

Using the “Recreational West” trip grouping, seasonal fluctuations are inferred by the monthly adjustment factors. A seasonal adjustment factor in the winter of 1.21 means that the traffic is multiplied by 1.21 in order to be adjusted, or, put differently, it is 83 percent of the average monthly traffic counts (1 / 1.21 = 0.83). Similarly, the summer adjustment factor of 0.79 equates to 126 percent of average monthly traffic counts (1 / 0.79 = 1.26).

Table 13 Seasonal Adjustment Factors

Month	Rec - West	Seasonal Average
JAN	1.30	1.21
FEB	1.23	
MAR	1.32	
APR	1.18	
MAY	0.95	0.79
JUN	0.82	
JUL	0.70	
AUG	0.69	
SEP	0.97	
OCT	0.96	
NOV	1.16	1.21
DEC	2.25	

The calculation in Table 13 implies that the summer months could have a roughly 26 percent increase above the average monthly ridership and the winter months could have a 17 percent decrease from average monthly ridership. For estimation purposes, a +/- 20 percent seasonal variation is an appropriate assumption for the proposed service.

Appendix E

Cost Estimation

Low Build Scenario

	TRACK WORK								
A	**Track Construction - Westminster, MA**	**Takeoff Qty**			**Unit Price**			**Total Cost**	
Construct new track adjacent to main line									
	Intall New Ballast (12" thick)	3900	TN	$	50.00	/TN	$	195,000.00	
	Install new Rail	13728	TF	$	75.00	/TF	$	1,029,600.00	
	Install New Ties	8450	EA	$	150.00	/EA	$	1,267,500.00	
	Resilient Fastener Tie Plate Assembly	16900	EA	$	50.00	/EA	$	845,000.00	
	Flashbutt Welds	352	EA	$	500.00	/EA	$	176,000.00	
	Surface & Align	13728	LF	$	46.03	/LF	$	631,899.84	
Construct retaining wall/slope stabilization for new track									
	CIP Retaining Wall (15" thick)	1910	CY	$	1,027.60	/CY	$	1,962,716.00	
	Excavation	9152	CY	$	25.00	/CY	$	228,800.00	
	Backfill	4576.00	CY	$	32.00	/CY	$	146,432.00	
Modify CPF 335 to accommodate second track									
	#10 Turnout	1	EA	$	163,767.56	/EA	$	163,767.56	
	Track Throw	200	LF	$	42.93	/LF	$	8,586.00	
Construction new hi-speed Interlocking at CPF 337									
	Equilateral No. 20	1	EA	$	208,527.60	/EA	$	208,527.60	
	Access Road	200	SY	$	125.00	/SY	$	25,000.00	
	Grading	200	SY	$	6.50	/SY	$	1,300.00	
	Surface & Align	200	LF	$	46.03	/LF	$	9,206.00	
	Total A:						**$**	**6,899,335.00**	$ 6,899,335.00
B	**Track Construction - Greenfield/Deerfield, MA**	**Takeoff Qty**			**Unit Price**			**Total Cost**	
Construct new track from 385.2 to 389.1									
	Intall New Ballast (12" thick)	5850	TN	$	50.00	/TN	$	292,500.00	
	Install new Rail	20592	TF	$	75.00	/TF	$	1,544,400.00	
	Install New Ties	12674	EA	$	150.00	/EA	$	1,901,100.00	
	Resilient Fastener Tie Plate Assembly	25348	EA	$	50.00	/EA	$	1,267,400.00	
	Flashbutt Welds	528	EA	$	500.00	/EA	$	264,000.00	
	Surface & Align	20592	LF	$	46.03	/LF	$	947,849.76	
Construct retaining wall/slope stabilization for new track									
	CIP Retaining Wall (15" thick)	1430	CY	$	1,027.60	/CY	$	1,469,468.00	
	Excavation	5720.0	CY	$	25.00	/CY	$	143,000.00	
	Backfill	3432.0	CY	$	32.00	/CY	$	109,824.00	
Modify CPF 385 to accommodate second track									
	#10 Turnout	1	EA	$	163,767.56	/EA	$	163,767.56	
	Track Throw	200	LF	$	42.93	/LF	$	8,586.00	
Construction new Interlocking at CPF 389									
	Equilateral No. 20	1	EA	$	87,430.00	/EA	$	87,430.00	
	Access Road	200	SY	$	125.00	/SY	$	25,000.00	
	Grading	200	SY	$	6.50	/SY	$	1,300.00	
	Surface & Align	200	LF	$	46.03	/LF	$	9,206.00	
	Total B:						**$**	**8,234,831.32**	$ 8,234,831.32
C	**Track Rehabilitation from class 1 to class 2**	**Takeoff Qty**			**Unit Price**			**Total Cost**	
Ties									
	Demo Existing Ties	2400	EA	$	50.00	/EA	$	120,000.00	
	Install New Ties	2400	EA	$	150.00	/EA	$	360,000.00	
	Resilient Fastener Tie Plate Assembly	4800	EA	$	50.00	/EA	$	240,000.00	
Rail									
	Demo Existing Rail	17673.33	TF	$	46.39	/TF	$	819,865.78	
	Install new Rail	17673.33	TF	$	75.00	/TF	$	1,325,499.75	
	Mechanical Joints	454	EA	$	350.00	/EA	$	158,900.00	
Ballast									
	Remove Existing Ballast	17673.33	TF	$	58.39	/TF	$	1,031,945.74	
	Install New Ballast	9000.00	TN	$	50.00	/TN	$	450,000.00	
Surfacing									

Low Build Scenario

	Surface & Align	31,680.00	LF	$ 46.03	/LF	$ 1,458,230.40				
	Total C:					**$ 5,964,441.67**	$ 5,964,441.67			
D	**State of good repair to remove slow orders**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
	No Change in Type, Just Align & Ballast									
	Install New Ties	87068	EA	$ 50.00	/EA	$ 4,353,400.00				
	Install New Ballast	87068	TN	$ 150.00	/TN	$ 13,060,200.00				
	Surface & Align	1,225,910	LF	$ 46.03	/LF	$ 56,428,637.30				
	Total D:					**$ 69,488,837.30**	$ 69,488,837.30			
E	**Turnout Replacement Package**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
	All turnouts located on main tracks to be replaced, including sibling turnouts at crossovers									
	Demolish Existing Turnout	5	EA	$ 52,421.76	/EA	$ 262,108.80				
	Install #10 Turnout	5	EA	$ 163,767.56	/EA	$ 818,837.80				
	Total E:					**$ 1,080,946.60**	$ 1,080,946.60			
F	**Canopy/Brush Cutting**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
	increase visibility on ROW for higher speeds/signal preview									
	Clearing Both Sides of ROW (15' each)	182.40	ACRE	$ 36,000.00	/A	$ 6,566,400.00				
	Total F:					**$ 6,566,400.00**	$ 6,566,400.00			
							$ 98,112,916.91		$ 188,975,289.25	Track subtotal
G	**Layover Facility - North Adams, MA**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
	Construct new track									
	Install New Ballast (12" thick)	3333.333	TN	$ 50.00	/TN	$ 166,666.67				
	Install new Rail	5000	TF	$ 75.00	/TF	$ 375,000.00				
	Install New Ties	3077	EA	$ 150.00	/EA	$ 461,550.00				
	Resilient Fastener Tie Plate Assembly	6154	EA	$ 50.00	/EA	$ 307,700.00				
	Flashbutt Welds	129	EA	$ 500.00	/EA	$ 64,500.00				
	Surface & Align	5000	LF	$ 46.03	/LF	$ 230,150.00				
	Install No. 20 Turnout	1	EA	$ 208,527.60	/EA	$ 208,527.60				
	Install No. 10 Turnout	2	EA	$ 163,767.56	/EA	$ 327,535.12				
	Install No. 8 Turnout	3	EA	$ 102,078.23	/EA	$ 306,234.69				
	Bumping Posts	4	EA	$ 3,500.00	/EA	$ 14,000.00				
	Switch Derail	4	EA	$ 3,200.00	/EA	$ 12,800.00				
	Replace Northern Track									
	Demo Existing Ties	1650	EA	$ 50.00	/EA	$ 82,500.00				
	Install New Ties	1650	EA	$ 150.00	/EA	$ 247,500.00				
	Resilient Fastener Tie Plate Assembly	3300	EA	$ 50.00	/EA	$ 165,000.00				
	Demo Existing Rail	2680	TF	$ 46.39	/TF	$ 124,325.20				
	Install new Rail	2680	TF	$ 75.00	/TF	$ 201,000.00				
	Joint Demo	69	EA	$ 414.91	/EA	$ 28,628.79				
	Thermite Weld	69	EA	$ 500.00	/EA	$ 34,500.00				
	Remove Existing Ballast	2680	TF	$ 58.39	/TF	$ 156,485.20				
	Install New Ballast	1786.667	TN	$ 50.00	/TN	$ 89,333.33				
	Clearing, Grubbing, & Grading for New Tracks									
	Clear & Grub	7.5	A	$ 40,000.00	/A	$ 300,000.00				
	Grading	36550	SY	$ 2.00	/SY	$ 73,100.00				
	Excavation for track subgrade	24368	CY	$ 45.00	/CY	$ 1,096,554.83				
	Access Road									
	Rubber Rail Seal	4000	TF	$ 389.30	/TF	$ 1,557,200.00				
	Subbase	2104.61	CY	$ 32.00	/CY	$ 67,347.53				
	Grading	9423.63	SY	$ 2.00	/SY	$ 18,847.26				
	Paving	9423.63	SY	$ 150.00	/SY	$ 1,413,544.17				
	Total H:					**$ 8,130,530.37**	$ 8,130,530.37		$ 15,660,214.55	Layover Subtotal
H	**Bridge Rehabilitations**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
	Bridge Rehabilitations									

Low Build Scenario

	Item	Takeoff Qty	Unit Price	Total Cost
	# of Bridges	97 ea	$ 2,300,000.00 /EA	$ 223,100,000.00
	Total H:			**$ 223,100,000.00**
I	**Signal Replacement**	**Takeoff Qty**	**Unit Price**	**Total Cost**
	Signal Replacement			
	Single Track Wayside Signal	11 ea	$ 282,782.00 /EA	$ 3,110,602.00
	Double Track Wayside Signal	8 ea	$ 378,921.00 /EA	$ 3,031,368.00
	Tie-In Case Wayside Signal	14 ea	$ 54,895.00 /EA	$ 768,530.00
	End of Siding Wayside Signal	10 ea	$ 1,142,825.00 /EA	$ 11,428,250.00
	Modifying Existing Interlocking	2 ea	$ 410,588.00 /EA	$ 821,176.00
	Convert Electric Lock	13 ea	$ 129,490.00 /EA	$ 1,683,370.00
	Modify Interlocking - PTC Derail	1 ea	$ 185,248.00 /EA	$ 185,248.00
	Insulated Joints	102 ea	$ 3,159.72 /EA	$ 322,291.44
	Total I:			**$ 21,350,835.44**
J	**Crossing Renewal**	**Takeoff Qty**	**Unit Price**	**Total Cost**
	Every crossing to be rebuilt to meet track class and super rebuild track and road			
	Single Track	6 EA	$ 346,392.00 /EA	$ 2,078,352.00
	Double Track	5 EA	$ 416,588.00 /EA	$ 2,082,940.00
	Speed Update (Single Track)	3 EA	$ 25,000.00 /EA	$ 75,000.00
	Speed Update (Double Track)	1 EA	$ 50,000.00 /EA	$ 50,000.00
	Replace Rail			
	Demo Existing Ties	32 EA	$ 50.00 /EA	$ 1,600.00
	Install New Ties	32 EA	$ 150.00 /EA	$ 4,800.00
	Resilient Fastener Tie Plate Assembly	64 EA	$ 50.00 /EA	$ 3,200.00
	Demo Existing Rail	480 TF	$ 46.39 /TF	$ 22,267.20
	Install new Rail	480 TF	$ 75.00 /TF	$ 36,000.00
	Mechanical Joints	32 EA	$ 350.00 /EA	$ 11,200.00
	Remove Existing Ballast	480 TF	$ 58.39 /TF	$ 28,027.20
	Install New Ballast	320 TN	$ 50.00 /TN	$ 16,000.00
	Surface & Align	480 LF	$ 46.03 /LF	$ 22,094.40
	Total J:			**$ 4,431,480.80**
K	**PTC**	**Takeoff Qty**	**Unit Price**	**Total Cost**
	PTC Implementation			
	PTC Implementation	1 LS	$ 45,963,527.00 /EA	$ 45,963,527.00
	Total K:			**$ 45,963,527.00**
L	**Station Modification**	**Takeoff Qty**	**Unit Price**	**Total Cost**
	North Adams & Greenfield Lump Sum			
	Station Modification	1 LS	12000000 /EA	$ 12,000,000.00
	Total L:			**$ 12,000,000.00**
M	**Salvage Cost for Demo Rail**	**Takeoff Qty**	**Unit Price**	**Total Cost**
	Demo Rail	20833 TF	$5.85 /LS	$ (121,874.98)
	Total M:			**$ (121,874.98)**

Running Total:	**$ 413,089,290.52**
50% Contingency:	**$ 206,544,645.26**
15% Design & Permitting Fees:	**$ 61,963,393.58**
Vehicle Allowance:	**$ 65,000,000.00**
27.61% Escalation:	**$ 131,996,366.80**
Total Cost:	**$ 878,593,696**
	$ 918,152,531.00

$ 223,100,000.00		$ 429,712,910.00	Bridge Total
$ 21,350,835.44		$ 41,123,844.14	Signals Subtotal
$ 4,431,480.80		$ 8,535,475.17	Track Subtotal #2
$ 45,963,527.00		$ 88,530,349.35	Signals PTC Subtotal
		$ 129,654,193.50	Signals total
$ 12,000,000.00		$ 23,113,200.00	Stations Subtotal
		$ 38,773,414.55	Layover + Stations Total
		$ 197,510,764.42	Track total
$ (121,874.98)		$ 197,388,889.44	Track Net of salvage Total

Low Build Scenario

	Total	50% Contingency	15% D&P	Vehicles	Escalation	**Total**
Track Work	$ 98,112,916.91	$ 49,056,458.45	$ 14,716,937.54		$27,088,137.77	**$ 188,974,450.67**
Bridges	$ 223,100,000.00	$ 111,550,000.00	$ 33,465,000.00		$61,596,003.13	**$ 429,711,003.13**
Signals & Grade Xings	$ 71,745,843.24	$ 35,872,921.62	$ 10,761,876.49		$19,808,414.09	**$ 138,189,055.44**
Electrification	$ -	$ -	$ -		$0.00	**$ -**
Stations	$ 12,000,000.00	$ 6,000,000.00	$ 1,800,000.00		$3,313,097.43	**$ 23,113,097.43**
Layover	$ 8,130,530.37	$ 4,065,265.19	$ 1,219,579.56		$2,244,769.94	**$ 15,660,145.06**
Rolling Stock				$65,000,000.00	$17,945,944.43	**$ 82,945,944.43**
Total	$ 413,089,290.52	$ 206,544,645.26	$ 61,963,393.58	$65,000,000.00	$131,996,366.80	**$ 878,593,696.16**
	$ -					

Higher Build Scenario

TRACK WORK

A	**Track Construction - Westminster, MA**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
	Construct new track adjacent to main line						
	Install New Ballast (12" thick)	3900	TN	$ 50.00	/TN	$ 195,000.00	
	Install new Rail	13728	TF	$ 75.00	/TF	$ 1,029,600.00	
	Install New Ties	8450	EA	$ 150.00	/EA	$ 1,267,500.00	
	Resilient Fastener Tie Plate Assembly	16900	EA	$ 50.00	/EA	$ 845,000.00	
	Flashbutt Welds	352	EA	$ 500.00	/EA	$ 176,000.00	
	Surface & Align	20592	LF	$ 46.03	/LF	$ 947,849.76	
	Construct retaining wall/slope stabilization for new track						
	CIP Retaining Wall (15" thick)	1910	CY	$ 1,027.60	/CY	$ 1,962,716.00	
	Excavation	9152	CY	$ 25.00	/CY	$ 228,800.00	
	Backfill	4576.00	CY	$ 32.00	/CY	$ 146,432.00	
	Modify CPF 335 to accommodate second track						
	#10 Turnout	1	EA	$ 163,767.56	/EA	$ 163,767.56	
	Track Throw	200	LF	$ 42.93	/LF	$ 8,586.00	
	Construction new hi-speed Interlocking at CPF 337						
	Equilateral No. 20	1	EA	$ 208,527.60	/EA	$ 208,527.60	
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00	
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00	
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00	
	Total A:					**$ 7,215,284.92**	$ 7,215,284.92

B	**Track Construction - Charlemont/Rowe, MA**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
	Construct new track adjacent to main line						
	Install New Ballast (12" thick)	3300	TN	$ 50.00	/TN	$ 165,000.00	
	Install new Rail	11616	TF	$ 75.00	/TF	$ 871,200.00	
	Install New Ties	7150	EA	$ 150.00	/EA	$ 1,072,546.15	
	Resilient Fastener Tie Plate Assembly	14300.61538	EA	$ 50.00	/EA	$ 715,030.77	
	Flashbutt Welds	298	EA	$ 500.00	/EA	$ 149,000.00	
	Surface & Align	20592	LF	$ 46.03	/LF	$ 947,849.76	
	Construct retaining wall/slope stabilization for new track						
	CIP Retaining Wall (15" thick)	1613.3	CY	$ 1,027.60	/CY	$ 1,657,861.33	
	Excavation	6453.3	CY	$ 25.00	/CY	$ 161,333.33	
	Backfill	3872.0	CY	$ 32.00	/CY	$ 123,904.00	
	Modify Existing CPF 415 to accommodate second track						
	#10 Turnout	1	EA	$ 163,767.56	/EA	$ 163,767.56	
	Track Throw	200	LF	$ 42.93	/LF	$ 8,586.00	
	Construction new hi-speed Interlocking at CPF 411						
	Equilateral No. 20	1	EA	$ 87,430.00	/EA	$ 87,430.00	
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00	
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00	
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00	
	Total B:					**$ 6,159,014.91**	$ 6,159,014.91

C	**Rehabilitation of track from class 1 to 3**	**Takeoff Qty**		**Unit Price**		**Total Cost**
	Ties					
	Demo Existing Ties	4150	EA	$ 50.00	/EA	$ 207,500.00
	Install New Ties	4150	EA	$ 150.00	/EA	$ 622,500.00
	Resilient Fastener Tie Plate Assembly	8300	EA	$ 50.00	/EA	$ 415,000.00
	Rail					
	Demo Existing Rail	13693.58	TF	$ 46.39	/TF	$ 635,245.18
	Install new Rail	13693.58	TF	$ 75.00	/TF	$ 1,027,018.50
	Mechanical Joints	352	EA	$ 350.00	/EA	$ 123,200.00
	Ballast					
	Remove Existing Ballast	13693.58	TF	$ 58.39	/TF	$ 799,568.14
	Install New Ballast	11670.66	TN	$ 50.00	/TN	$ 583,533.24
	Surfacing					

Higher Build Scenario

	Surface & Align	41080.74	LF	$	46.03	/LF	$	1,890,946.46		
	Total C:						**$**	**6,304,511.51**	$	6,304,511.51
D	**Rehabilitation of track from class 2 to 3**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Ties										
	Demo Existing Ties	39355	EA	$	50.00	/EA	$	1,967,750.00		
	Install New Ties	39355	EA	$	150.00	/EA	$	5,903,250.00		
	Resilient Fastener Tie Plate Assembly	78710	EA	$	50.00	/EA	$	3,935,500.00		
Rail										
	Demo Existing Rail	207791.33	TF	$	46.39	/TF	$	9,639,439.80		
	Install new Rail	207791.33	TF	$	75.00	/TF	$	15,584,349.75		
	Mechanical Joints	5328	EA	$	350.00	/EA	$	1,864,800.00		
Ballast										
	Remove Existing Ballast	207791.33	TF	$	58.39	/TF	$	12,132,935.76		
	Install New Ballast	98386.05	TN	$	50.00	/TN	$	4,919,302.32		
Surfacing										
	Surface & Align	415,582.66	LF	$	46.03	/LF	$	19,129,269.84		
	Total D:						**$**	**75,076,597.47**	$	75,076,597.47
E	**Rehabilitation of 10.86 miles of track from class 1 to 4**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Ties										
	Demo Existing Ties	17376	EA	$	50.00	/EA	$	868,800.00		
	Install New Ties	17376	EA	$	150.00	/EA	$	2,606,400.00		
	Resilient Fastener Tie Plate Assembly	34752	EA	$	50.00	/EA	$	1,737,600.00		
Rail										
	Demo Existing Rail	114682	TF	$	46.39	/TF	$	5,320,097.98		
	Install new Rail	114682	TF	$	75.00	/TF	$	8,601,150.00		
	Mechanical Joints	2867	EA	$	350.00	/EA	$	1,003,467.50		
Ballast										
	Remove Existing Ballast	114682	TF	$	58.39	/TF	$	6,696,281.98		
	Install New Ballast	48870.00	TN	$	50.00	/TN	$	2,443,500.00		
Surfacing										
	Surface & Align	172022	LF	$	46.03	/LF	$	7,918,172.66		
	Total E:						**$**	**37,195,470.12**	$	37,195,470.12
F	**Rehabilitation of track from class 2 to 4**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Ties										
	Demo Existing Ties	112411	EA	$	50.00	/EA	$	5,620,550.00		
	Install New Ties	112411	EA	$	150.00	/EA	$	16,861,650.00		
	Resilient Fastener Tie Plate Assembly	224822	EA	$	50.00	/EA	$	11,241,100.00		
Rail										
	Demo Existing Rail	913123	TF	$	46.39	/TF	$	42,359,775.97		
	Install new Rail	913123	TF	$	75.00	/TF	$	68,484,225.00		
	Mechanical Joints	22828	EA	$	350.00	/EA	$	7,989,826.25		
Ballast										
	Remove Existing Ballast	913123	TF	$	58.39	/TF	$	53,317,251.97		
	Install New Ballast	216175.00	TN	$	50.00	/TN	$	10,808,750.00		
Surfacing										
	Surface & Align	913123	LF	$	46.03	/LF	$	42,031,051.69		
	Total F:						**$**	**258,714,180.88**	$	258,714,180.88
G	**Rehabilitation of track from class 3 to 4**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Ties										
	Demo Existing Ties	22836	EA	$	50.00	/EA	$	1,141,800.00		
	Install New Ties	22836	EA	$	150.00	/EA	$	3,425,400.00		
	Resilient Fastener Tie Plate Assembly	45672	EA	$	50.00	/EA	$	2,283,600.00		
Rail										

Higher Build Scenario

	Demo Existing Rail	109613	TF	$ 46.39	/TF	$ 5,084,947.07	
	Install new Rail	109613	TF	$ 75.00	/TF	$ 8,220,975.00	
Joint Elimination							
	Joint Demo	2803	EA	$ 414.91	/EA	$ 1,162,992.73	
	Thermite Weld	2803	EA	$ 500.00	/EA	$ 1,401,500.00	
Ballast							
	Remove Existing Ballast	109613	TF	$ 58.39	/TF	$ 6,400,303.07	
	Install New Ballast	31140.00	TN	$ 50.00	/TN	$ 1,557,000.00	
Surfacing							
	Surface & Align	219226	LF	$ 46.03	/LF	$ 10,090,972.78	
	Total G:					**$ 40,769,490.65**	$ 40,769,490.65
H	**State of Good Repair to Remove Slow Orders**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
No Change in Type, Just Align & Ballast							
	Install New Ballast	8353.31	TN	$ 50.00	/TN	$ 417,665.72	
	Surface & Align	88,211.00	LF	$ 46.03	/LF	$ 4,060,352.33	
	Total H:					**$ 4,478,018.05**	$ 4,478,018.05
I	**Turnout Replacement Package**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
All turnouts located on main tracks to be replaced, including sibling turnouts at crossovers							
	Demolish Existing Turnout	40	EA	$ 52,421.76	/EA	$ 2,096,870.40	
	Install No. 10 Turnout	40	EA	$ 163,767.56	/EA	$ 6,550,702.40	
	Total I:					**$ 8,647,572.80**	$ 8,647,572.80
J	**Crossing Renewal**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
Every crossing to be rebuilt to meet track class and super							
	Single Track	10	EA	$ 346,392.00	/EA	$ 3,463,920.00	
	Double Track	6	EA	$ 416,588.00	/EA	$ 2,499,528.00	
	Triple Track	1	EA	$ 499,905.60	/EA	$ 499,905.60	
	Speed Update (Single Track)	10	EA	$ 25,000.00	/EA	$ 250,000.00	
	Speed Update (Double Track and Triple Track)	7	EA	$ 50,000.00	/EA	$ 350,000.00	
Replace Rail							
	Demo Existing Ties	32	EA	$ 50.00	/EA	$ 1,600.00	
	Install New Ties	32	EA	$ 150.00	/EA	$ 4,800.00	
	Resilient Fastener Tie Plate Assembly	64	EA	$ 50.00	/EA	$ 3,200.00	
	Demo Existing Rail	750	TF	$ 46.39	/TF	$ 34,792.50	
	Install new Rail	750	TF	$ 75.00	/TF	$ 56,250.00	
	Mechanical Joints	50	EA	$ 350.00	/EA	$ 17,500.00	
	Remove Existing Ballast	750	TF	$ 58.39	/TF	$ 43,792.50	
	Install New Ballast	639	TN	$ 50.00	/TN	$ 31,960.23	
	Surface & Align	750	LF	$ 46.03	/LF	$ 34,522.50	
	Total J:					**$ 7,291,771.33**	$ 7,291,771.33
K	**Canopy/Brush Cutting**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
	increase visibility on ROW for higher speeds/signal preview						
	Clearing Both Sides of ROW (15' each)	390.18	ACRE	$ 36,000.00	/A	$ 14,046,458.43	
	Total K:					**$ 14,046,458.43**	$ 14,046,458.43
L	**Timber Bridge Deck Ties**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
Timber Bridge Deck Ties							
	Required to increase track class	1500	EA	$ 150.00	/EA	$ 225,000.00	
	Total L:					**$ 225,000.00**	$ 225,000.00
M	**Culvert Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**	

Higher Build Scenario

	Culvert Replacement						
	Remove & Replace Existing Culvert	6 EA	$ 830,000.00 /LS	$ 4,980,000.00			
	Total M:			**$ 4,980,000.00**	$ 4,980,000.00	$ 455,841,952.22	
						$ 877,997,184.16	Track subtotal
N	**Layover Facility - North Adams, MA**						
	Construct new track						
	Install New Ballast (12" thick)	3666.667 TN	$ 50.00 /TN	$ 183,333.33			
	Install new Rail	5500 TF	$ 75.00 /TF	$ 412,500.00			
	Install New Ties	3385 EA	$ 150.00 /EA	$ 507,750.00			
	Resilient Fastener Tie Plate Assembly	6770 EA	$ 50.00 /EA	$ 338,500.00			
	Flashbutt Welds	142 EA	$ 500.00 /EA	$ 71,000.00			
	Surface & Align	5500 LF	$ 46.03 /LF	$ 253,165.00			
	Install No. 20 Turnout	1 EA	$ 208,527.60 /EA	$ 208,527.60			
	Install No. 10 Turnout	2 EA	$ 163,767.56 /EA	$ 327,535.12			
	Install No. 8 Turnout	3 EA	$ 102,078.23 /EA	$ 306,234.69			
	Bumping Posts	4 EA	$ 3,500.00 /EA	$ 14,000.00			
	Switch Derail	4 EA	$ 3,200.00 /EA	$ 12,800.00			
	Replace Northern Track						
	Demo Existing Ties	1650 EA	$ 50.00 /EA	$ 82,500.00			
	Install New Ties	1650 EA	$ 150.00 /EA	$ 247,500.00			
	Resilient Fastener Tie Plate Assembly	3300 EA	$ 50.00 /EA	$ 165,000.00			
	Demo Existing Rail	2680 TF	$ 46.39 /TF	$ 124,325.20			
	Install new Rail	2680 TF	$ 75.00 /TF	$ 201,000.00			
	Joint Demo	69 EA	$ 414.91 /EA	$ 28,628.79			
	Thermite Weld	69 EA	$ 500.00 /EA	$ 34,500.00			
	Remove Existing Ballast	2680 TF	$ 58.39 /TF	$ 156,485.20			
	Install New Ballast	1786.667 TN	$ 50.00 /TN	$ 89,333.33			
	Clearing, Grubbing, & Grading for New Tracks						
	Clear & Grub	7.5 A	$ 40,000.00 /A	$ 300,000.00			
	Grading	36550 SY	$ 2.00 /SY	$ 73,100.00			
	Excavation for track subgrade	24368 CY	$ 45.00 /CY	$ 1,096,554.83			
	Access Road						
	Rubber Rail Seal	4000 TF	$ 389.30 /TF	$ 1,557,200.00			
	Subbase	2104.61 CY	$ 32.00 /CY	$ 67,347.53			
	Grading	9423.63 SY	$ 2.00 /SY	$ 18,847.26			
	Paving	9423.63 SY	$ 150.00 /SY	$ 1,413,544.17			
	Total N:			**$ 8,291,212.04**	$ 8,291,212.04	$ 15,969,703.51	Layover Subtotal
O	**Bridge Rehabilitations**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
	Bridge Rehabilitations						
	# of Bridges	97 ea	$ 2,300,000.00 /EA	$ 223,100,000.00			
	Total O:			**$ 223,100,000.00**	$ 223,100,000.00	$ 429,712,910.00	Bridge Total
P	**Signal Replacement**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
	Signal Replacement						
	Single Track Wayside Signal	12 ea	$ 282,782.00 /EA	$ 3,393,384.00			
	Double Track Wayside Signal	8 ea	$ 378,921.00 /EA	$ 3,031,368.00			
	Tie-In Case Wayside Signal	15 ea	$ 54,895.00 /EA	$ 823,425.00			
	End of Siding Wayside Signal	9 ea	$ 1,142,825.00 /EA	$ 10,285,425.00			
	Modifying Existing Interlocking	1 ea	$ 410,588.00 /EA	$ 410,588.00			
	Convert Electric Lock	13 ea	$ 129,490.00 /EA	$ 1,683,370.00			
	Modify Interlocking - PTC Derail	1 ea	$ 185,248.00 /EA	$ 185,248.00			
	Insulated Joints	104 ea	$ 3,159.72 /EA	$ 328,610.88			
	Total P:			**$ 20,141,418.88**	$ 20,141,418.88	$ 38,794,386.90	Signal Subtotal
Q	**PTC**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
	PTC Implementation						
	PTC Implementation	1 LS	$ 45,963,527.00 /EA	$ 45,963,527.00			

Higher Build Scenario

		Takeoff Qty	Unit Price	Total Cost	
	Total Q:			**$ 45,963,527.00**	$ 45,963,527.00
R	**Station Modification**	**Takeoff Qty**	**Unit Price**	**Total Cost**	
North Adams & Greenfield Lump Sum					
	Station Modification	1 LS	$ 12,000,000.00 /EA	$ 12,000,000.00	
	Total R:			**$ 12,000,000.00**	$ 12,000,000.00
S	**Salvage Cost for Demo Rail**	**Takeoff Qty**	**Unit Price**	**Total Cost**	
	Demo Rail	1362333 TF	$5.85 /LS	$ (7,969,647.52)	
	Total V:			**$ (7,969,647.52)**	$ (7,969,647.52)

Running Total:	**$ 772,629,881.46**
50% Contingency:	**$ 386,314,940.73**
15% Design & Permitting Fees:	**$ 115,894,482.22**
Vehicle Allowance:	**$ 65,000,000.00**
27.61% Escalation:	**$ 231,262,450.91**
Total Cost:	**$ 1,571,101,755**
	$ 1,610,660,590.00

$ 88,530,349.35	Signal PTX Subtotal
$ 127,324,736.26	Signal Total
$ 23,113,200.00	Stations
$ 39,082,903.51	Layover + Stations Total
$ 877,997,184.16	Track total
$ 870,027,536.64	Track Net of salvage Total

	Total	50% Contingency	15% D&P	Vehicles	Escalation	**Total**
Track Work	$ 455,841,952.22	$ 227,920,976.11	$ 68,376,292.83		$125,854,066.85	**$ 877,993,288.00**
Bridges	$ 223,100,000.00	$ 111,550,000.00	$ 33,465,000.00		$61,596,003.13	**$ 429,711,003.13**
Signals & Grade Xings	$ 73,396,717.21	$ 36,698,358.60	$ 11,009,507.58		$20,264,206.29	**$ 141,368,789.68**
Electrification		$ -	$ -		$0.00	**$ -**
Stations	$ 12,000,000.00	$ 6,000,000.00	$ 1,800,000.00		$3,313,097.43	**$ 23,113,097.43**
Layover	$ 8,291,212.04	$ 4,145,606.02	$ 1,243,681.81		$2,289,132.78	**$ 15,969,632.64**
Rolling Stock				$65,000,000.00	$17,945,944.43	**$ 82,945,944.43**
Total	$ 772,629,881.46	$ 386,314,940.73	$115,894,482.22	$65,000,000.00	$231,262,450.91	**$ 1,571,101,755.32**
	$ -					

Alternative 3

A	**Track Construction - Charlemont/Rowe, MA**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Construct new track adjacent to main line									
	Install New Ballast (12" thick)	4455	TN	$ 50.00	/TN	$ 222,750.00			
	Install new Rail	15682	TF	$ 75.00	/TF	$ 1,176,150.00			
	Install New Ties	9801	EA	$ 150.00	/EA	$ 1,470,187.50			
	Resilient Fastener Tie Plate Assembly	19602.5	EA	$ 50.00	/EA	$ 980,125.00			
	Flashbutt Welds	298	EA	$ 500.00	/EA	$ 149,000.00			
	Surface & Align	15682	LF	$ 46.03	/LF	$ 721,842.46			
Realign main line to accomodate second track									
	Surface and realign	15682	LF	$ 42.93	/LF	$ 673,228.26			
Relocated existing fiber optic (?) utility adjacent to exisitng main track									
	Relocate	15682	LF	$ 4.20	/LF	$ 65,864.40			
Bozrah Brook UGB									
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00			
Chickley River UGB									
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00			
Rebuild West Hawley Rd (Rt 8A) grade crossing for 2 tracks									
	Rebuild Grade Crossing	1	LS	$ 1,800,000.00	/LS	$ 1,800,000.00			
Rebuild Towers Rd grade crossing for 2 tracks									
	Rebuild Grade Crossing	1	LS	$ 1,800,000.00	/LS	$ 1,800,000.00			
Rebuild farm crossing									
	Double Track	1	EA	$ 416,588.00	/EA	$ 416,588.00			
Construct new Interlocking at CPF 406									
	Equilateral No. 20	1	EA	$ 208,527.60	/EA	$ 208,527.60			
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00			
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00			
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00			
	Electrical, Signal & Communication	1	LS	$ 196,874.00	/LS	$ 196,874.00			
Construct new Interlocking at CPF 409									
	Equilateral No. 20	1	EA	$ 208,527.60	/EA	$ 208,527.60			
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00			
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00			
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00			
	Electrical, Signal & Communication	1	LS	$ 196,874.00	/LS	$ 196,874.00			
	Total A:					**$ 12,757,550.82**	$ 12,757,550.82		
B	**Track Construction - Westminster, MA**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Construct new track adjacent to main line									
	Install New Ballast (12" thick)	3900	TN	$ 50.00	/TN	$ 195,000.00			
	Install new Rail	13728	TF	$ 75.00	/TF	$ 1,029,600.00			
	Install New Ties	8450	EA	$ 150.00	/EA	$ 1,267,500.00			
	Resilient Fastener Tie Plate Assembly	16900	EA	$ 50.00	/EA	$ 845,000.00			
	Flashbutt Welds	352	EA	$ 500.00	/EA	$ 176,000.00			
	Surface & Align	20592	LF	$ 46.03	/LF	$ 947,849.76			
Construct retaining wall/slope stabilization for new track									
	CIP Retaining Wall (15" thick)	1910	CY	$ 1,027.60	/CY	$ 1,962,716.00			
	Excavation	9152	CY	$ 25.00	/CY	$ 228,800.00			
	Backfill	4576.00	CY	$ 32.00	/CY	$ 146,432.00			
Modify CPF 335 to accommodate second track									
	#10 Turnout	1	EA	$ 163,767.56	/EA	$ 163,767.56			
	Track Throw	200	LF	$ 42.93	/LF	$ 8,586.00			
Construction new hi-speed Interlocking at CPF 337									
	Equilateral No. 20	1	EA	$ 208,527.60	/EA	$ 208,527.60			
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00			
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00			
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00			
	Total B:						🟥		Only Applies to High Bookend, not needed here
C	**Rehabilitation of track from class 1 to 3**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Ties									
	Demo Existing Ties	4150	EA	$ 50.00	/EA	$ 207,500.00			
	Install New Ties	4150	EA	$ 150.00	/EA	$ 622,500.00			
	Resilient Fastener Tie Plate Assembly	8300	EA	$ 50.00	/EA	$ 415,000.00			
Rail									
	Demo Existing Rail	13693.58	TF	$ 46.39	/TF	$ 635,245.18			
	Install new Rail	13693.58	TF	$ 75.00	/TF	$ 1,027,018.50			
	Mechanical Joints	352	EA	$ 350.00	/EA	$ 123,200.00			
Ballast									
	Remove Existing Ballast	13693.58	TF	$ 58.39	/TF	$ 799,568.14			
	Install New Ballast	11670.66	TN	$ 50.00	/TN	$ 583,533.24			
Surfacing									

Alternative 3

		Takeoff Qty		Unit Price		Total Cost		
	Surface & Align	41080.74	LF	$ 46.03	/LF	$ 1,890,946.46		
	Total C:					**$ 6,304,511.51**	$ 6,304,511.51	
D	**Rehabilitation of track from class 2 to 3**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	39355	EA	$ 50.00	/EA	$ 1,967,750.00		
	Install New Ties	39355	EA	$ 150.00	/EA	$ 5,903,250.00		
	Resilient Fastener Tie Plate Assembly	78710	EA	$ 50.00	/EA	$ 3,935,500.00		
Rail								
	Demo Existing Rail	207791.33	TF	$ 46.39	/TF	$ 9,639,439.80		
	Install new Rail	207791.33	TF	$ 75.00	/TF	$ 15,584,349.75		
	Mechanical Joints	5328	EA	$ 350.00	/EA	$ 1,864,800.00		
Ballast								
	Remove Existing Ballast	207791.33	TF	$ 58.39	/TF	$ 12,132,935.76		
	Install New Ballast	98386.05	TN	$ 50.00	/TN	$ 4,919,302.32		
Surfacing								
	Surface & Align	415,582.66	LF	$ 46.03	/LF	$ 19,129,269.84		
	Total D:					**$ 75,076,597.47**	$ 75,076,597.47	
E	**Rehabilitation of 10.86 miles of track from class 1 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	17376	EA	$ 50.00	/EA	$ 868,800.00		
	Install New Ties	17376	EA	$ 150.00	/EA	$ 2,606,400.00		
	Resilient Fastener Tie Plate Assembly	34752	EA	$ 50.00	/EA	$ 1,737,600.00		
Rail								
	Demo Existing Rail	114682	TF	$ 46.39	/TF	$ 5,320,097.98		
	Install new Rail	114682	TF	$ 75.00	/TF	$ 8,601,150.00		
	Mechanical Joints	2867	EA	$ 350.00	/EA	$ 1,003,467.50		
Ballast								
	Remove Existing Ballast	114682	TF	$ 58.39	/TF	$ 6,696,281.98		
	Install New Ballast	48870.00	TN	$ 50.00	/TN	$ 2,443,500.00		
Surfacing								
	Surface & Align	172022	LF	$ 46.03	/LF	$ 7,918,172.66		
	Total E:					**$ 37,195,470.12**	$ 37,195,470.12	
F	**Rehabilitation of track from class 2 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	112411	EA	$ 50.00	/EA	$ 5,620,550.00		
	Install New Ties	112411	EA	$ 150.00	/EA	$ 16,861,650.00		
	Resilient Fastener Tie Plate Assembly	224822	EA	$ 50.00	/EA	$ 11,241,100.00		
Rail								
	Demo Existing Rail	913123	TF	$ 46.39	/TF	$ 42,359,775.97		
	Install new Rail	913123	TF	$ 75.00	/TF	$ 68,484,225.00		
	Mechanical Joints	22828	EA	$ 350.00	/EA	$ 7,989,826.25		
Ballast								
	Remove Existing Ballast	913123	TF	$ 58.39	/TF	$ 53,317,251.97		
	Install New Ballast	216175.00	TN	$ 50.00	/TN	$ 10,808,750.00		
Surfacing								
	Surface & Align	913123	LF	$ 46.03	/LF	$ 42,031,051.69		
	Total F:					**$ 258,714,180.88**	$ 258,714,180.88	
G	**Rehabilitation of track from class 3 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	22836	EA	$ 50.00	/EA	$ 1,141,800.00		
	Install New Ties	22836	EA	$ 150.00	/EA	$ 3,425,400.00		
	Resilient Fastener Tie Plate Assembly	45672	EA	$ 50.00	/EA	$ 2,283,600.00		
Rail								
	Demo Existing Rail	109613	TF	$ 46.39	/TF	$ 5,084,947.07		
	Install new Rail	109613	TF	$ 75.00	/TF	$ 8,220,975.00		
Joint Elimination								
	Joint Demo	2803	EA	$ 414.91	/EA	$ 1,162,992.73		
	Thermite Weld	2803	EA	$ 500.00	/EA	$ 1,401,500.00		
Ballast								
	Remove Existing Ballast	109613	TF	$ 58.39	/TF	$ 6,400,303.07		
	Install New Ballast	31140.00	TN	$ 50.00	/TN	$ 1,557,000.00		
Surfacing								
	Surface & Align	219226	LF	$ 46.03	/LF	$ 10,090,972.78		
	Total G:					**$ 40,769,490.65**	$ 40,769,490.65	

Alternative 3

H	**State of Good Repair to Remove Slow Orders**	**Takeoff Qty**			**Unit Price**			**Total Cost**			
No Change in Type, Just Align & Ballast											
	Install New Ballast	8353.31	TN	$	50.00	/TN	$	417,665.72			
	Surface & Align	88,211.00	LF	$	46.03	/LF	$	4,060,352.33			
	Total H:						**$**	**4,478,018.05**	$ 4,478,018.05		
I	**Turnout Replacement Package**	**Takeoff Qty**			**Unit Price**			**Total Cost**			
All turnouts located on main tracks to be replaced, including sibling turnouts at crossovers											
	Demolish Existing Turnout	40	EA	$	52,421.76	/EA	$	2,096,870.40			
	Install No. 10 Turnout	40	EA	$	163,767.56	/EA	$	6,550,702.40			
	Total I:						**$**	**8,647,572.80**	$ 8,647,572.80		
J	**Crossing Renewal**	**Takeoff Qty**			**Unit Price**			**Total Cost**			
Every crossing to be rebuilt to meet track class and super											
	Single Track	10	EA	$	346,392.00	/EA	$	3,463,920.00			
	Double Track	6	EA	$	416,588.00	/EA	$	2,499,528.00			
	Triple Track	1	EA	$	499,905.60	/EA	$	499,905.60			
	Speed Update (Single Track)	10	EA	$	25,000.00	/EA	$	250,000.00			
	Speed Update (Double Track and Triple Track)	7	EA	$	50,000.00	/EA	$	350,000.00			
Replace Rail											
	Demo Existing Ties	32	EA	$	50.00	/EA	$	1,600.00			
	Install New Ties	32	EA	$	150.00	/EA	$	4,800.00			
	Resilient Fastener Tie Plate Assembly	64	EA	$	50.00	/EA	$	3,200.00			
	Demo Existing Rail	750	TF	$	46.39	/TF	$	34,792.50			
	Install new Rail	750	TF	$	75.00	/TF	$	56,250.00			
	Mechanical Joints	50	EA	$	350.00	/EA	$	17,500.00			
	Remove Existing Ballast	750	TF	$	58.39	/TF	$	43,792.50			
	Install New Ballast	639	TN	$	50.00	/TN	$	31,960.23			
	Surface & Align	750	LF	$	46.03	/LF	$	34,522.50			
	Total J:						**$**	**7,291,771.33**	$ 7,291,771.33		
K	**Canopy/Brush Cutting**	**Takeoff Qty**			**Unit Price**			**Total Cost**			
	increase visibility on ROW for higher speeds/signal preview										
	Clearing Both Sides of ROW (15' each)	390.18	ACRE	$	36,000.00	/A	$	14,046,458.43			
	Total K:						**$**	**14,046,458.43**	$ 14,046,458.43		
L	**Timber Bridge Deck Ties**	**Takeoff Qty**			**Unit Price**			**Total Cost**			
Timber Bridge Deck Ties											
	Required to increase track class	1500	EA	$	150.00	/EA	$	225,000.00			
	Total L:						**$**	**225,000.00**	$ 225,000.00		
M	**Culvert Replacement**	**Takeoff Qty**			**Unit Price**			**Total Cost**			
Culvert Replacement											
	Remove & Replace Existing Culvert	6	EA	$	830,000.00	/LS	$	4,980,000.00			
	Total M:						**$**	**4,980,000.00**	$ 4,980,000.00		
									$ 455,225,203.21	$ 876,809,263.90	Track subtotal
N	**Layover Facility - North Adams, MA**										
Construct new track											
	Install New Ballast (12" thick)	3666.667	TN	$	50.00	/TN	$	183,333.33			
	Install new Rail	5500	TF	$	75.00	/TF	$	412,500.00			
	Install New Ties	3385	EA	$	150.00	/EA	$	507,750.00			
	Resilient Fastener Tie Plate Assembly	6770	EA	$	50.00	/EA	$	338,500.00			
	Flashbutt Welds	142	EA	$	500.00	/EA	$	71,000.00			
	Surface & Align	5500	LF	$	46.03	/LF	$	253,165.00			
	Install No. 20 Turnout	1	EA	$	208,527.60	/EA	$	208,527.60			
	Install No. 10 Turnout	2	EA	$	163,767.56	/EA	$	327,535.12			
	Install No. 8 Turnout	3	EA	$	102,078.23	/EA	$	306,234.69			
	Bumping Posts	4	EA	$	3,500.00	/EA	$	14,000.00			
	Switch Derail	4	EA	$	3,200.00	/EA	$	12,800.00			
Replace Northern Track											
	Demo Existing Ties	1650	EA	$	50.00	/EA	$	82,500.00			
	Install New Ties	1650	EA	$	150.00	/EA	$	247,500.00			
	Resilient Fastener Tie Plate Assembly	3300	EA	$	50.00	/EA	$	165,000.00			
	Demo Existing Rail	2680	TF	$	46.39	/TF	$	124,325.20			
	Install new Rail	2680	TF	$	75.00	/TF	$	201,000.00			
	Joint Demo	69	EA	$	414.91	/EA	$	28,628.79			
	Thermite Weld	69	EA	$	500.00	/EA	$	34,500.00			
	Remove Existing Ballast	2680	TF	$	58.39	/TF	$	156,485.20			

Alternative 3

	Install New Ballast	1786.667 TN	$ 50.00 /TN	$ 89,333.33			
Clearing, Grubbing, & Grading for New Tracks							
	Clear & Grub	7.5 A	$ 40,000.00 /A	$ 300,000.00			
	Grading	36550 SY	$ 2.00 /SY	$ 73,100.00			
	Excavation for track subgrade	24368 CY	$ 45.00 /CY	$ 1,096,554.83			
Access Road							
	Rubber Rail Seal	4000 TF	$ 389.30 /TF	$ 1,557,200.00			
	Subbase	2104.61 CY	$ 32.00 /CY	$ 67,347.53			
	Grading	9423.63 SY	$ 2.00 /SY	$ 18,847.26			
	Paving	9423.63 SY	$ 150.00 /SY	$ 1,413,544.17			
	Total N:			**$ 8,291,212.04**	$ 8,291,212.04	$ 15,969,703.51	Layover Subtotal
O	**Bridge Rehabilitations**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
Bridge Rehabilitations							
	# of Bridges	97 ea	$ 2,300,000.00 /EA	$ 223,100,000.00			
	Total O:			**$ 223,100,000.00**	$ 223,100,000.00	$ 429,712,910.00	Bridge Total
P	**Signal Replacement**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
Signal Replacement							
	Single Track Wayside Signal	12 ea	$ 282,782.00 /EA	$ 3,393,384.00			
	Double Track Wayside Signal	8 ea	$ 378,921.00 /EA	$ 3,031,368.00			
	Tie-In Case Wayside Signal	15 ea	$ 54,895.00 /EA	$ 823,425.00			
	End of Siding Wayside Signal	9 ea	$ 1,142,825.00 /EA	$ 10,285,425.00			
	Modifying Existing Interlocking	1 ea	$ 410,588.00 /EA	$ 410,588.00			
	Convert Electric Lock	13 ea	$ 129,490.00 /EA	$ 1,683,370.00			
	Modify Interlocking - PTC Derail	1 ea	$ 185,248.00 /EA	$ 185,248.00			
	Insulated Joints	104 ea	$ 3,159.72 /EA	$ 328,610.88			
	Total P:			**$ 20,141,418.88**	$ 20,141,418.88	$ 38,794,386.90	Signals Subtotal
Q	**PTC**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
PTC Implementation							
	PTC Implementation	1 LS	$ 45,963,527.00 /EA	$ 45,963,527.00			
	Total Q:			**$ 45,963,527.00**	$ 45,963,527.00	$ 88,530,349.35	Signals PTC Subtotal
						$ 127,324,736.26	Signals total
R	**Station Modification**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
North Adams & Greenfield Lump Sum							
	Station Modification	1 LS	$ 12,000,000.00 /EA	$ 12,000,000.00			
Athol Lump Sum							
	Station Modification	1 LS	$ 6,000,000.00 /EA	$ 6,000,000.00			
	Total R:			**$ 18,000,000.00**	$ 18,000,000.00	$ 34,669,800.00	Stations
						$ 50,639,503.51	Layover + Stations Total
S	**OCS**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
Overhead Contact System - Electrification							
	OCS Electrification (Single Track) - CPF335 to North Adams	76.92 Mile	$ 3,000,000.00 /Mile	$ 230,760,000.00			
	OCS Electrification (Double Track) - CPF335 to North Adams	68.52 Mile	$ 3,000,000.00 /Mile	$ 205,560,000.00			
	Total S:			**$ 436,320,000.00**	$ 436,320,000.00	$ 840,395,952.00	Elec-OCS - Subtotal
T	**OCR**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
Overhead Conductor Rail - Electrification							
	OCR Electrification	4.75 Mile	$ 750,000.00 /Mile	$ 3,562,500.00			
	Total T:			**$ 3,562,500.00**	$ 3,562,500.00	$ 6,861,731.25	Elec-OCR - Subtotal
U	**TPS**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
Traction Power System - Electrification							
	Main Supply Subs	2 LS	$ 30,000,000.00 /LS	$ 60,000,000.00			
	Switching Stations	1 LS	$ 20,000,000.00 /LS	$ 20,000,000.00			
	Parallel Stations	15 LS	$ 10,000,000.00 /LS	$ 150,000,000.00			
	Real Estate Cost	1 LS	$ 17,500,000.00 /LS	$ 17,500,000.00			
	Utility Connection Allowance	1 LS	$ 1,000,000.00 /LS	$ 1,000,000.00			
	Total U:			**$ 248,500,000.00**	$ 248,500,000.00	$ 478,635,850.00	Elec-TPS subtotal
						$ 1,325,893,533.25	Electrical total
V	**Salvage Cost for Demo Rail**	**Takeoff Qty**	**Unit Price**	**Total Cost**			
						$ 876,809,263.90	Track total
	Demo Rail	1362333 TF	$5.85 /LS	$ (7,969,647.52)	$ (7,969,647.52)	$ 868,839,616.37	Track Net of salvage Total
	Total V:			**$ (7,969,647.52)**			

Alternative 3

Running Total:	**$ 1,466,395,632.45**	$ 1,473,610,917.37	$ 2,838,321,987.95
50% Contingency:	**$ 733,197,816.23**		$ 102,088,000.00
15% Design & Permitting Fees:	**$ 219,959,344.87**		$ 2,940,409,987.95
Vehicle Allowance:	**$ 80,000,000.00**	$ 80,000,000.00	$ 102,088,000.00
27.61% Escalation:	**$ 426,946,616.81**		$ 141,647,100.00
Total Cost:	**$ 2,926,499,410**		
	2,979,955,544		

	Total	50% Contingency	15% D&P	Vehicles	Escalation	**Total**
Track Work	$ 455,225,203.21	$ 227,612,601.60	$ 68,283,780.48		$125,683,787.72	**$ 876,805,373.01**
Bridges	$ 223,100,000.00	$ 111,550,000.00	$ 33,465,000.00		$61,596,003.13	**$ 429,711,003.13**
Signals & Grade Xings	$ 73,396,717.21	$ 36,698,358.60	$ 11,009,507.58		$20,264,206.29	**$ 141,368,789.68**
Electrification	$ 688,382,500.00	$ 344,191,250.00	$103,257,375.00		$190,056,524.53	**$ 1,325,887,649.53**
Stations	$ 18,000,000.00	$ 9,000,000.00	$ 2,700,000.00		$4,969,646.15	**$ 34,669,646.15**
Layover	$ 8,291,212.04	$ 4,145,606.02	$ 1,243,681.81		$2,289,132.78	**$ 15,969,632.64**
Rolling Stock				$80,000,000.00	$22,087,316.23	**$ 102,087,316.23**
Total	$ 1,466,395,632.45	$ 733,197,816.23	$219,959,344.87	$80,000,000.00	$426,946,616.81	**$ 2,926,499,410.36**
	$ -					

Alternative 4

A	**Track Construction - Buckland, MA**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Construct new track adjacent to main line										
	Install New Ballast (12" thick)	3390	TN	$	50.00	/TN	$	169,500.00		
	Install new Rail	11880	TF	$	75.00	/TF	$	891,000.00		
	Install New Ties	7313	EA	$	150.00	/EA	$	1,096,915.38		
	Resilient Fastener Tie Plate Assembly	14625.53846	EA	$	50.00	/EA	$	731,276.92		
	Flashbutt Welds	305	EA	$	500.00	/EA	$	152,500.00		
	Surface & Align	11880	LF	$	46.03	/LF	$	546,836.40		
Realign main line to accomodate second track										
	Surface and realign	11880	LF	$	42.93	/LF	$	510,008.40		
Relocated existing fiber optic (?) utility adjacent to exisitng main track										
	Relocate	11880	LF	$	4.20	/LF	$	49,896.00		
Rebuild farm crossing										
	Double Track	1	EA	$	416,588.00	/EA	$	416,588.00		
Modify Interlocking at CPF 402, replace turnout with crossover										
	Modify Interlocking	1	ea	$	422,039.00	/EA	$	422,039.00		
Construct new Interlocking at CPF 404										
	Equilateral No. 20	1	EA	$	208,527.60	/EA	$	208,527.60		
	Access Road	200	SY	$	125.00	/SY	$	25,000.00		
	Grading	200	SY	$	6.50	/SY	$	1,300.00		
	Surface & Align	200	LF	$	46.03	/LF	$	9,206.00		
	Electrical, Signal & Communication	1	LS	$	196,874.00	/LS	$	196,874.00		
	Total A:						**$**	**5,427,467.71**	$ 5,427,467.71	
B	**Track Construction - Westminster, MA**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Construct new track adjacent to main line										
	Install New Ballast (12" thick)	3900	TN	$	50.00	/TN	$	195,000.00		
	Install new Rail	13728	TF	$	75.00	/TF	$	1,029,600.00		
	Install New Ties	8450	EA	$	150.00	/EA	$	1,267,500.00		
	Resilient Fastener Tie Plate Assembly	16900	EA	$	50.00	/EA	$	845,000.00		
	Flashbutt Welds	352	EA	$	500.00	/EA	$	176,000.00		
	Surface & Align	20592	LF	$	46.03	/LF	$	947,849.76		
Construct retaining wall/slope stabilization for new track										
	CIP Retaining Wall (15" thick)	1910	CY	$	1,027.60	/CY	$	1,962,716.00		
	Excavation	9152	CY	$	25.00	/CY	$	228,800.00		
	Backfill	4576.00	CY	$	32.00	/CY	$	146,432.00		
Modify CPF 335 to accommodate second track										
	#10 Turnout	1	EA	$	163,767.56	/EA	$	163,767.56		
	Track Throw	200	LF	$	42.93	/LF	$	8,586.00		
Construction new hi-speed Interlocking at CPF 337										
	Equilateral No. 20	1	EA	$	208,527.60	/EA	$	208,527.60		
	Access Road	200	SY	$	125.00	/SY	$	25,000.00		
	Grading	200	SY	$	6.50	/SY	$	1,300.00		
	Surface & Align	200	LF	$	46.03	/LF	$	9,206.00		
	Total B:								🟥	Only Applies to High Bookend, not needed here
C	**Track Construction - Charlemont/Rowe, MA**	**Takeoff Qty**			**Unit Price**			**Total Cost**		
Construct new track adjacent to main line										
	Install New Ballast (12" thick)	3300	TN	$	50.00	/TN	$	165,000.00		
	Install new Rail	11616	TF	$	75.00	/TF	$	871,200.00		
	Install New Ties	7150	EA	$	150.00	/EA	$	1,072,546.15		
	Resilient Fastener Tie Plate Assembly	14300.61538	EA	$	50.00	/EA	$	715,030.77		
	Flashbutt Welds	298	EA	$	500.00	/EA	$	149,000.00		
	Surface & Align	20592	LF	$	46.03	/LF	$	947,849.76		
Construct retaining wall/slope stabilization for new track										
	CIP Retaining Wall (15" thick)	1613.3	CY	$	1,027.60	/CY	$	1,657,861.33		
	Excavation	6453.3	CY	$	25.00	/CY	$	161,333.33		
	Backfill	3872.0	CY	$	32.00	/CY	$	123,904.00		
Modify Existing CPF 415 to accommodate second track										
	#10 Turnout	1	EA	$	163,767.56	/EA	$	163,767.56		
	Track Throw	200	LF	$	42.93	/LF	$	8,586.00		
Construction new hi-speed Interlocking at CPF 411										
	Equilateral No. 20	1	EA	$	87,430.00	/EA	$	87,430.00		
	Access Road	200	SY	$	125.00	/SY	$	25,000.00		

Alternative 4

	Grading	200	SY	$ 6.50	/SY	$ 1,300.00		
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00		
	Total C:						🟥	Only Applies to High Bookend, not needed here
D	**Rehabilitation of track from class 1 to 3**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	4150	EA	$ 50.00	/EA	$ 207,500.00		
	Install New Ties	4150	EA	$ 150.00	/EA	$ 622,500.00		
	Resilient Fastener Tie Plate Assembly	8300	EA	$ 50.00	/EA	$ 415,000.00		
Rail								
	Demo Existing Rail	13693.58	TF	$ 46.39	/TF	$ 635,245.18		
	Install new Rail	13693.58	TF	$ 75.00	/TF	$ 1,027,018.50		
	Mechanical Joints	352	EA	$ 350.00	/EA	$ 123,200.00		
Ballast								
	Remove Existing Ballast	13693.58	TF	$ 58.39	/TF	$ 799,568.14		
	Install New Ballast	11670.66	TN	$ 50.00	/TN	$ 583,533.24		
Surfacing								
	Surface & Align	41080.74	LF	$ 46.03	/LF	$ 1,890,946.46		
	Total D:					**$ 6,304,511.51**	$ 6,304,511.51	
E	**Rehabilitation of track from class 2 to 3**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	39355	EA	$ 50.00	/EA	$ 1,967,750.00		
	Install New Ties	39355	EA	$ 150.00	/EA	$ 5,903,250.00		
	Resilient Fastener Tie Plate Assembly	78710	EA	$ 50.00	/EA	$ 3,935,500.00		
Rail								
	Demo Existing Rail	207791.33	TF	$ 46.39	/TF	$ 9,639,439.80		
	Install new Rail	207791.33	TF	$ 75.00	/TF	$ 15,584,349.75		
	Mechanical Joints	5328	EA	$ 350.00	/EA	$ 1,864,800.00		
Ballast								
	Remove Existing Ballast	207791.33	TF	$ 58.39	/TF	$ 12,132,935.76		
	Install New Ballast	98386.05	TN	$ 50.00	/TN	$ 4,919,302.32		
Surfacing								
	Surface & Align	415,582.66	LF	$ 46.03	/LF	$ 19,129,269.84		
	Total E:					**$ 75,076,597.47**	$ 75,076,597.47	
F	**Rehabilitation of 10.86 miles of track from class 1 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	17376	EA	$ 50.00	/EA	$ 868,800.00		
	Install New Ties	17376	EA	$ 150.00	/EA	$ 2,606,400.00		
	Resilient Fastener Tie Plate Assembly	34752	EA	$ 50.00	/EA	$ 1,737,600.00		
Rail								
	Demo Existing Rail	114682	TF	$ 46.39	/TF	$ 5,320,097.98		
	Install new Rail	114682	TF	$ 75.00	/TF	$ 8,601,150.00		
	Mechanical Joints	2867	EA	$ 350.00	/EA	$ 1,003,467.50		
Ballast								
	Remove Existing Ballast	114682	TF	$ 58.39	/TF	$ 6,696,281.98		
	Install New Ballast	48870.00	TN	$ 50.00	/TN	$ 2,443,500.00		
Surfacing								
	Surface & Align	172022	LF	$ 46.03	/LF	$ 7,918,172.66		
	Total F:					**$ 37,195,470.12**	$ 37,195,470.12	
G	**Rehabilitation of track from class 2 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**		
Ties								
	Demo Existing Ties	112411	EA	$ 50.00	/EA	$ 5,620,550.00		
	Install New Ties	112411	EA	$ 150.00	/EA	$ 16,861,650.00		
	Resilient Fastener Tie Plate Assembly	224822	EA	$ 50.00	/EA	$ 11,241,100.00		
Rail								
	Demo Existing Rail	913123	TF	$ 46.39	/TF	$ 42,359,775.97		
	Install new Rail	913123	TF	$ 75.00	/TF	$ 68,484,225.00		
	Mechanical Joints	22828	EA	$ 350.00	/EA	$ 7,989,826.25		
Ballast								
	Remove Existing Ballast	913123	TF	$ 58.39	/TF	$ 53,317,251.97		
	Install New Ballast	216175.00	TN	$ 50.00	/TN	$ 10,808,750.00		

Alternative 4

Surfacing									
	Surface & Align	913123	LF	$	46.03	/LF	$	42,031,051.69	
	Total G:						**$**	**258,714,180.88**	$ 258,714,180.88
H	**Rehabilitation of track from class 3 to 4**	**Takeoff Qty**			**Unit Price**		**Total Cost**		
Ties									
	Demo Existing Ties	22836	EA	$	50.00	/EA	$	1,141,800.00	
	Install New Ties	22836	EA	$	150.00	/EA	$	3,425,400.00	
	Resilient Fastener Tie Plate Assembly	45672	EA	$	50.00	/EA	$	2,283,600.00	
Rail									
	Demo Existing Rail	109613	TF	$	46.39	/TF	$	5,084,947.07	
	Install new Rail	109613	TF	$	75.00	/TF	$	8,220,975.00	
Joint Elimination									
	Joint Demo	2803	EA	$	414.91	/EA	$	1,162,992.73	
	Thermite Weld	2803	EA	$	500.00	/EA	$	1,401,500.00	
Ballast									
	Remove Existing Ballast	109613	TF	$	58.39	/TF	$	6,400,303.07	
	Install New Ballast	31140.00	TN	$	50.00	/TN	$	1,557,000.00	
Surfacing									
	Surface & Align	219226	LF	$	46.03	/LF	$	10,090,972.78	
	Total H:						**$**	**40,769,490.65**	$ 40,769,490.65
I	**State of Good Repair to Remove Slow Orders**	**Takeoff Qty**			**Unit Price**		**Total Cost**		
No Change in Type, Just Align & Ballast									
	Install New Ballast	8353.31	TN	$	50.00	/TN	$	417,665.72	
	Surface & Align	88,211.00	LF	$	46.03	/LF	$	4,060,352.33	
	Total I:						**$**	**4,478,018.05**	$ 4,478,018.05
J	**Turnout Replacement Package**	**Takeoff Qty**			**Unit Price**		**Total Cost**		
All turnouts located on main tracks to be replaced, including sibling turnouts at crossovers									
	Demolish Existing Turnout	40	EA	$	52,421.76	/EA	$	2,096,870.40	
	Install No. 10 Turnout	40	EA	$	163,767.56	/EA	$	6,550,702.40	
	Total J:						**$**	**8,647,572.80**	$ 8,647,572.80
K	**Crossing Renewal**	**Takeoff Qty**			**Unit Price**		**Total Cost**		
Every crossing to be rebuilt to meet track class and super									
	Single Track	10	EA	$	346,392.00	/EA	$	3,463,920.00	
	Double Track	6	EA	$	416,588.00	/EA	$	2,499,528.00	
	Triple Track	1	EA	$	499,905.60	/EA	$	499,905.60	
	Speed Update (Single Track)	10	EA	$	25,000.00	/EA	$	250,000.00	
	Speed Update (Double Track and Triple Track)	7	EA	$	50,000.00	/EA	$	350,000.00	
Replace Rail									
	Demo Existing Ties	32	EA	$	50.00	/EA	$	1,600.00	
	Install New Ties	32	EA	$	150.00	/EA	$	4,800.00	
	Resilient Fastener Tie Plate Assembly	64	EA	$	50.00	/EA	$	3,200.00	
	Demo Existing Rail	750	TF	$	46.39	/TF	$	34,792.50	
	Install new Rail	750	TF	$	75.00	/TF	$	56,250.00	
	Mechanical Joints	50	EA	$	350.00	/EA	$	17,500.00	
	Remove Existing Ballast	750	TF	$	58.39	/TF	$	43,792.50	
	Install New Ballast	639	TN	$	50.00	/TN	$	31,960.23	
	Surface & Align	750	LF	$	46.03	/LF	$	34,522.50	
	Total K:						**$**	**7,291,771.33**	$ 7,291,771.33
L	**Canopy/Brush Cutting**	**Takeoff Qty**			**Unit Price**		**Total Cost**		
	increase visibility on ROW for higher speeds/signal preview								
	Clearing Both Sides of ROW (15' each)	390.18	ACRE	$	36,000.00	/A	$	14,046,458.43	
	Total L:						**$**	**14,046,458.43**	$ 14,046,458.43
M	**Timber Bridge Deck Ties**	**Takeoff Qty**			**Unit Price**		**Total Cost**		
Timber Bridge Deck Ties									
	Required to increase track class	1500	EA	$	150.00	/EA	$	225,000.00	

Alternative 4

	Total M:					**$ 225,000.00**	$ 225,000.00		
N	**Culvert Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Culvert Replacement									
	Remove & Replace Existing Culvert	6	EA	$ 830,000.00	/LS	$ 4,980,000.00			
	Total N:					**$ 4,980,000.00**	$ 4,980,000.00	$ 455,864,767.62	
								$ 878,041,128.91	Track Subtotal
O	**Layover Facility - North Adams, MA**								
Construct new track									
	Install New Ballast (12" thick)	3666.667	TN	$ 50.00	/TN	$ 183,333.33			
	Install new Rail	5500	TF	$ 75.00	/TF	$ 412,500.00			
	Install New Ties	3385	EA	$ 150.00	/EA	$ 507,750.00			
	Resilient Fastener Tie Plate Assembly	6770	EA	$ 50.00	/EA	$ 338,500.00			
	Flashbutt Welds	142	EA	$ 500.00	/EA	$ 71,000.00			
	Surface & Align	5500	LF	$ 46.03	/LF	$ 253,165.00			
	Install No. 20 Turnout	1	EA	$ 208,527.60	/EA	$ 208,527.60			
	Install No. 10 Turnout	2	EA	$ 163,767.56	/EA	$ 327,535.12			
	Install No. 8 Turnout	3	EA	$ 102,078.23	/EA	$ 306,234.69			
	Bumping Posts	4	EA	$ 3,500.00	/EA	$ 14,000.00			
	Switch Derail	4	EA	$ 3,200.00	/EA	$ 12,800.00			
Replace Northern Track									
	Demo Existing Ties	1650	EA	$ 50.00	/EA	$ 82,500.00			
	Install New Ties	1650	EA	$ 150.00	/EA	$ 247,500.00			
	Resilient Fastener Tie Plate Assembly	3300	EA	$ 50.00	/EA	$ 165,000.00			
	Demo Existing Rail	2680	TF	$ 46.39	/TF	$ 124,325.20			
	Install new Rail	2680	TF	$ 75.00	/TF	$ 201,000.00			
	Joint Demo	69	EA	$ 414.91	/EA	$ 28,628.79			
	Thermite Weld	69	EA	$ 500.00	/EA	$ 34,500.00			
	Remove Existing Ballast	2680	TF	$ 58.39	/TF	$ 156,485.20			
	Install New Ballast	1786.667	TN	$ 50.00	/TN	$ 89,333.33			
Clearing, Grubbing, & Grading for New Tracks									
	Clear & Grub	7.5	A	$ 40,000.00	/A	$ 300,000.00			
	Grading	36550	SY	$ 2.00	/SY	$ 73,100.00			
	Excavation for track subgrade	24368	CY	$ 45.00	/CY	$ 1,096,554.83			
Access Road									
	Rubber Rail Seal	4000	TF	$ 389.30	/TF	$ 1,557,200.00			
	Subbase	2104.61	CY	$ 32.00	/CY	$ 67,347.53			
	Grading	9423.63	SY	$ 2.00	/SY	$ 18,847.26			
	Paving	9423.63	SY	$ 150.00	/SY	$ 1,413,544.17			
	Total O:					**$ 8,291,212.04**	$ 8,291,212.04	$ 15,969,703.51	Layover Subtotal
P	**Bridge Rehabilitations**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Bridge Rehabilitations									
	# of Bridges	97	ea	$ 2,300,000.00	/EA	$ 223,100,000.00			
	Total P:					**$ 223,100,000.00**	$ 223,100,000.00	$ 429,712,910.00	Bridge Total
Q	**Signal Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Signal Replacement									
	Single Track Wayside Signal	12	ea	$ 282,782.00	/EA	$ 3,393,384.00			
	Double Track Wayside Signal	8	ea	$ 378,921.00	/EA	$ 3,031,368.00			
	Tie-In Case Wayside Signal	15	ea	$ 54,895.00	/EA	$ 823,425.00			
	End of Siding Wayside Signal	9	ea	$ 1,142,825.00	/EA	$ 10,285,425.00			
	Modifying Existing Interlocking	1	ea	$ 410,588.00	/EA	$ 410,588.00			
	Convert Electric Lock	13	ea	$ 129,490.00	/EA	$ 1,683,370.00			
	Modify Interlocking - PTC Derail	1	ea	$ 185,248.00	/EA	$ 185,248.00			
	Insulated Joints	104	ea	$ 3,159.72	/EA	$ 328,610.88			
	Total Q:					**$ 20,141,418.88**	$ 20,141,418.88	$ 38,794,386.90	Signals Subtotal
R	**PTC**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
PTC Implementation									
	PTC Implementation	1	LS	$ 45,963,527.00	/EA	$ 45,963,527.00			
	Total R:					**$ 45,963,527.00**	$ 45,963,527.00	$ 88,530,349.35	Signals PTC Subtotal
								$ 127,324,736.26	Signals total
S	**Station Modification**	**Takeoff Qty**		**Unit Price**		**Total Cost**			

Alternative 4

North Adams & Greenfield Lump Sum Station Modification	1 LS	$ 12,000,000.00 /EA	$	12,000,000.00
Shelburne Falls Lump Sum Station Modification	1 LS	$ 6,000,000.00 /EA	$	6,000,000.00
Athol Lump Sum Station Modification	1 LS	$ 6,000,000.00 /EA	$	6,000,000.00
Gardner Lump Sum Station Modification	1 LS	$ 6,000,000.00 /EA	$	6,000,000.00
Total S:			**$**	**30,000,000.00**

T	Salvage Cost for Demo Rail	Takeoff Qty	Unit Price	Total Cost
	Demo Rail	1362333 TF	$5.85 /LS	$ (7,969,647.52)
	Total T:			**$ (7,969,647.52)**

Running Total:	**$**	**782,683,049.34**
50% Contingency:	**$**	**391,341,524.67**
15% Design & Permitting Fees:	**$**	**117,402,457.40**
Vehicle Allowance:	**$**	**65,000,000.00**
27.61% Escalation:	**$**	**234,038,044.63**
Total Cost:	**$**	**1,590,465,076**
		1655784036

$ 30,000,000.00	$ 57,783,000.00	Stations
	$ 73,752,703.51	Layover + Stations
	$ 878,041,128.91	Track total
$ (7,969,647.52)	$ 870,071,481.39	Track Net of salvage
$ 65,000,000.00	$ 82,946,500.00	
	$ 122,505,600.00	

	Total	50% Contingency	15% D&P	Vehicles	Escalation	**Total**
Track Work	$ 447,895,120.10	$ 223,947,560.05	$ 67,184,268.02		$123,660,014.42	**$ 862,686,962.59**
Bridges	$ 223,100,000.00	$ 111,550,000.00	$ 33,465,000.00		$61,596,003.13	**$ 429,711,003.13**
Signals & Grade Xings	$ 73,396,717.21	$ 36,698,358.61	$ 11,009,507.58		$20,264,206.29	**$ 141,368,789.68**
Stations	$ 30,000,000.00	$ 15,000,000.00	$ 4,500,000.00		$8,282,743.58	**$ 57,782,743.58**
Layover	$ 8,291,212.04	$ 4,145,606.02	$ 1,243,681.81		$2,289,132.78	**$ 15,969,632.64**
Rolling Stock				$65,000,000.00	$17,945,944.43	**$ 82,945,944.43**
Total	$ 782,683,049.35	$ 391,341,524.68	$ 117,402,457.40	$65,000,000.00	$234,038,044.63	**$ 1,590,465,076.06**
	$ (0.01)					

Alternative 5

A	Track Construction - Charlemont/Zoar, MA	Takeoff Qty		Unit Price		Total Cost	
Construct new track adjacent to main line							
	Install New Ballast (12" thick)	9300	TN	$ 50.00	/TN	$ 465,000.00	
	Install new Rail	32736	TF	$ 75.00	/TF	$ 2,455,200.00	
	Install New Ties	20147	EA	$ 150.00	/EA	$ 3,022,084.62	
	Resilient Fastener Tie Plate Assembly	40294.46154	EA	$ 50.00	/EA	$ 2,014,723.08	
	Flashbutt Welds	840	EA	$ 500.00	/EA	$ 420,000.00	
	Surface & Align	32736	LF	$ 46.03	/LF	$ 1,506,838.08	
Realign main line to accomodate second track							
	Surface and realign	32736	LF	$ 42.93	/LF	$ 1,405,356.48	
Relocated existing fiber optic (?) utility adjacent to exisitng main track							
	Relocate	32736	LF	$ 4.20	/LF	$ 137,491.20	
Construct retaining wall/slope stabilization for new track							
	CIP Retaining Wall (15" thick)	1613.3	CY	$ 1,027.60	/CY	$ 1,657,861.33	
	Excavation	6453.3	CY	$ 25.00	/CY	$ 161,333.33	
	Backfill	3872.0	CY	$ 32.00	/CY	$ 123,904.00	
Chickley River UGB							
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00	
Deerfield River UGB							
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00	
Pelham Brook UGB							
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00	
Hoosac Tunnel Rd UGB							
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00	
UGB (per track chart)							
	Construct New 30' Span	1	LS	$ 1,200,000.00	/LS	$ 1,200,000.00	
Rebuild Towers Rd grade crossing for 2 tracks							
	Rebuild Grade Crossing	1	LS	$ 1,800,000.00	/LS	$ 1,800,000.00	
Rebuild farm crossing							
	Double Track	1	EA	$ 416,588.00	/EA	$ 416,588.00	
Construct new Interlocking at CPF 407							
	Equilateral No. 20	1	EA	$ 208,527.60	/EA	$ 208,527.60	
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00	
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00	
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00	
	Electrical, Signal & Communication	1	LS	$ 196,874.00	/LS	$ 196,874.00	
Construct new Interlocking at CPF 409							
	Equilateral No. 20	1	EA	$ 208,527.60	/EA	$ 208,527.60	
	Access Road	200	SY	$ 125.00	/SY	$ 25,000.00	
	Grading	200	SY	$ 6.50	/SY	$ 1,300.00	
	Surface & Align	200	LF	$ 46.03	/LF	$ 9,206.00	
	Electrical, Signal & Communication	1	LS	$ 196,874.00	/LS	$ 196,874.00	
Remove CPF 414							
	Demolish Existing Turnout	1	EA	$ 52,421.76	/EA	$ 52,421.76	
	Total A:					**$ 22,271,321.32**	$ 22,271,321.32

B	Track Construction - Stillwater/Mechanicville, NY	Takeoff Qty		Unit Price		Total Cost
Construct new track adjacent to main line						
	Install New Ballast (12" thick)	1875	TN	$ 50.00	/TN	$ 93,750.00
	Install new Rail	6600	TF	$ 75.00	/TF	$ 495,000.00
	Install New Ties	4064	EA	$ 150.00	/EA	$ 609,530.77
	Resilient Fastener Tie Plate Assembly	8127.076923	EA	$ 50.00	/EA	$ 406,353.85
	Flashbutt Welds	170	EA	$ 500.00	/EA	$ 85,000.00
	Surface & Align	6600	LF	$ 46.03	/LF	$ 303,798.00
Realign main line to accomodate second track						
	Surface and realign	6600	LF	$ 42.93	/LF	$ 283,338.00
Relocated existing fiber optic (?) utility adjacent to exisitng main track						
	Relocate	6600	LF	$ 4.20	/LF	$ 27,720.00
Anthony's Kill UGB						
	Construct New 30' Span	1	LS	$ 3,200,000.00	/LS	$ 3,200,000.00
Rebuild Vial Ave grade crossing for 2 tracks						
	Rebuild Grade Crossing	1	LS	$ 1,800,000.00	/LS	$ 1,800,000.00
Modify Interlocking at CPF 466						
	Modify Interlocking	1	ea	$ 422,039.00	/EA	$ 422,039.00
Modify Interlocking at CPF 467						

Alternative 5

		Takeoff Qty	Unit Price	Total Cost	
	Modify Interlocking	1 ea	$ 422,039.00 /EA	$ 422,039.00	
	Total B:			**$ 8,148,568.62**	$ 8,148,568.62
C	**Track Construction - Clifton Park/Mechanicville, NY**	**Takeoff Qty**	**Unit Price**	**Total Cost**	
Construct new track adjacent to main line					
	Install New Ballast (12" thick)	5925 TN	$ 50.00 /TN	$ 296,250.00	
	Install new Rail	20856 TF	$ 75.00 /TF	$ 1,564,200.00	
	Install New Ties	12836 EA	$ 150.00 /EA	$ 1,925,469.23	
	Resilient Fastener Tie Plate Assembly	25672.92308 EA	$ 50.00 /EA	$ 1,283,646.15	
	Flashbutt Welds	535 EA	$ 500.00 /EA	$ 267,500.00	
	Surface & Align	20856 LF	$ 46.03 /LF	$ 960,001.68	
Realign main line to accomodate second track					
	Surface and realign	20856 LF	$ 42.93 /LF	$ 895,348.08	
Relocated existing fiber optic (?) utility adjacent to exisitng main track					
	Relocate	20856 LF	$ 4.20 /LF	$ 87,595.20	
NY Route 9 UGB					
	Construct New 30' Span	1 LS	$ 3,200,000.00 /LS	$ 3,200,000.00	
Dwaas Kill UGB					
	Construct New 30' Span	1 LS	$ 3,200,000.00 /LS	$ 3,200,000.00	
Farm road UGB					
	Construct New 30' Span	1 LS	$ 3,200,000.00 /LS	$ 3,200,000.00	
Rebuild Pierce Rd grade crossing for 2 tracks					
	Rebuild Grade Crossing	1 LS	$ 1,800,000.00 /LS	$ 1,800,000.00	
Rebuild Tabor Rd grade crossing for 2 tracks					
	Rebuild Grade Crossing	1 LS	$ 1,800,000.00 /LS	$ 1,800,000.00	
Rebuild farm grade crossing for 2 tracks					
	Rebuild Grade Crossing	1 LS	$ 1,800,000.00 /LS	$ 1,800,000.00	
Rebuild Usher's Road grade crossing for 2 tracks					
	Rebuild Grade Crossing	1 LS	$ 1,800,000.00 /LS	$ 1,800,000.00	
Rebuild Cary Road grade crossing for 2 tracks					
	Rebuild Grade Crossing	1 LS	$ 1,800,000.00 /LS	$ 1,800,000.00	
Construct new Interlocking at CPF 473					
	Equilateral No. 20	1 EA	$ 208,527.60 /EA	$ 208,527.60	
	Access Road	200 SY	$ 125.00 /SY	$ 25,000.00	
	Grading	200 SY	$ 6.50 /SY	$ 1,300.00	
	Surface & Align	200 LF	$ 46.03 /LF	$ 9,206.00	
	Electrical, Signal & Communication	1 LS	$ 196,874.00 /LS	$ 196,874.00	
Modify Interlocking at CPF 469					
	Modify Interlocking	1 ea	$ 422,039.00 /EA	$ 422,039.00	
	Total C:			**$ 26,742,956.94**	$ 26,742,956.94
D	**Track Construction - Westminster, MA**	**Takeoff Qty**	**Unit Price**	**Total Cost**	
Construct new track adjacent to main line					
	Install New Ballast (12" thick)	3900 TN	$ 50.00 /TN	$ 195,000.00	
	Install new Rail	13728 TF	$ 75.00 /TF	$ 1,029,600.00	
	Install New Ties	8450 EA	$ 150.00 /EA	$ 1,267,500.00	
	Resilient Fastener Tie Plate Assembly	16900 EA	$ 50.00 /EA	$ 845,000.00	
	Flashbutt Welds	352 EA	$ 500.00 /EA	$ 176,000.00	
	Surface & Align	20592 LF	$ 46.03 /LF	$ 947,849.76	
Construct retaining wall/slope stabilization for new track					
	CIP Retaining Wall (15" thick)	1910 CY	$ 1,027.60 /CY	$ 1,962,716.00	
	Excavation	9152 CY	$ 25.00 /CY	$ 228,800.00	
	Backfill	4576.00 CY	$ 32.00 /CY	$ 146,432.00	
Modify CPF 335 to accommodate second track					
	#10 Turnout	1 EA	$ 163,767.56 /EA	$ 163,767.56	
	Track Throw	200 LF	$ 42.93 /LF	$ 8,586.00	
Construction new hi-speed Interlocking at CPF 337					
	Equilateral No. 20	1 EA	$ 208,527.60 /EA	$ 208,527.60	
	Access Road	200 SY	$ 125.00 /SY	$ 25,000.00	
	Grading	200 SY	$ 6.50 /SY	$ 1,300.00	
	Surface & Align	200 LF	$ 46.03 /LF	$ 9,206.00	
	Total D:				🟥 Only Applies to High Bookend, not needed here
E	**Track Construction - Charlemont/Rowe, MA**	**Takeoff Qty**	**Unit Price**	**Total Cost**	

Alternative 5

Construct new track adjacent to main line					
	Install New Ballast (12" thick)	3300 TN	$ 50.00 /TN	$ 165,000.00	
	Install new Rail	11616 TF	$ 75.00 /TF	$ 871,200.00	
	Install New Ties	7150 EA	$ 150.00 /EA	$ 1,072,546.15	
	Resilient Fastener Tie Plate Assembly	14300.61538 EA	$ 50.00 /EA	$ 715,030.77	
	Flashbutt Welds	298 EA	$ 500.00 /EA	$ 149,000.00	
	Surface & Align	20592 LF	$ 46.03 /LF	$ 947,849.76	
Construct retaining wall/slope stabilization for new track					
	CIP Retaining Wall (15" thick)	1613.3 CY	$ 1,027.60 /CY	$ 1,657,861.33	
	Excavation	6453.3 CY	$ 25.00 /CY	$ 161,333.33	
	Backfill	3872.0 CY	$ 32.00 /CY	$ 123,904.00	
Modify Existing CPF 415 to accommodate second track					
	#10 Turnout	1 EA	$ 163,767.56 /EA	$ 163,767.56	
	Track Throw	200 LF	$ 42.93 /LF	$ 8,586.00	
Construction new hi-speed Interlocking at CPF 411					
	Equilateral No. 20	1 EA	$ 87,430.00 /EA	$ 87,430.00	
	Access Road	200 SY	$ 125.00 /SY	$ 25,000.00	
	Grading	200 SY	$ 6.50 /SY	$ 1,300.00	
	Surface & Align	200 LF	$ 46.03 /LF	$ 9,206.00	
	Total E:				🟥 Only Applies to High Bookend, not needed here

F	Rehabilitation of track from class 1 to 3	Takeoff Qty	Unit Price	Total Cost	
Ties					
	Demo Existing Ties	4150 EA	$ 50.00 /EA	$ 207,500.00	
	Install New Ties	4150 EA	$ 150.00 /EA	$ 622,500.00	
	Resilient Fastener Tie Plate Assembly	8300 EA	$ 50.00 /EA	$ 415,000.00	
Rail					
	Demo Existing Rail	13693.58 TF	$ 46.39 /TF	$ 635,245.18	
	Install new Rail	13693.58 TF	$ 75.00 /TF	$ 1,027,018.50	
	Mechanical Joints	352 EA	$ 350.00 /EA	$ 123,200.00	
Ballast					
	Remove Existing Ballast	13693.58 TF	$ 58.39 /TF	$ 799,568.14	
	Install New Ballast	11670.66 TN	$ 50.00 /TN	$ 583,533.24	
Surfacing					
	Surface & Align	41080.74 LF	$ 46.03 /LF	$ 1,890,946.46	
	Total F:			**$ 6,304,511.51**	$ 6,304,511.51

G	Rehabilitation of track from class 2 to 3	Takeoff Qty	Unit Price	Total Cost	
Ties					
	Demo Existing Ties	39355 EA	$ 50.00 /EA	$ 1,967,750.00	
	Install New Ties	39355 EA	$ 150.00 /EA	$ 5,903,250.00	
	Resilient Fastener Tie Plate Assembly	78710 EA	$ 50.00 /EA	$ 3,935,500.00	
Rail					
	Demo Existing Rail	207791.33 TF	$ 46.39 /TF	$ 9,639,439.80	
	Install new Rail	207791.33 TF	$ 75.00 /TF	$ 15,584,349.75	
	Mechanical Joints	5328 EA	$ 350.00 /EA	$ 1,864,800.00	
Ballast					
	Remove Existing Ballast	207791.33 TF	$ 58.39 /TF	$ 12,132,935.76	
	Install New Ballast	98386.05 TN	$ 50.00 /TN	$ 4,919,302.32	
Surfacing					
	Surface & Align	415,582.66 LF	$ 46.03 /LF	$ 19,129,269.84	
	Total G:			**$ 75,076,597.47**	$ 75,076,597.47

H	Rehabilitation of 10.86 miles of track from class 1 to 4	Takeoff Qty	Unit Price	Total Cost
Ties				
	Demo Existing Ties	17376 EA	$ 50.00 /EA	$ 868,800.00
	Install New Ties	17376 EA	$ 150.00 /EA	$ 2,606,400.00
	Resilient Fastener Tie Plate Assembly	34752 EA	$ 50.00 /EA	$ 1,737,600.00
Rail				
	Demo Existing Rail	114682 TF	$ 46.39 /TF	$ 5,320,097.98
	Install new Rail	114682 TF	$ 75.00 /TF	$ 8,601,150.00
	Mechanical Joints	2867 EA	$ 350.00 /EA	$ 1,003,467.50
Ballast				
	Remove Existing Ballast	114682 TF	$ 58.39 /TF	$ 6,696,281.98
	Install New Ballast	48870.00 TN	$ 50.00 /TN	$ 2,443,500.00

Alternative 5

Surfacing							
	Surface & Align	172022	LF	$ 46.03	/LF	$ 7,918,172.66	
	Total H:					**$ 37,195,470.12**	$ 37,195,470.12
I	**Rehabilitation of track from class 2 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
Ties							
	Demo Existing Ties	112411	EA	$ 50.00	/EA	$ 5,620,550.00	
	Install New Ties	112411	EA	$ 150.00	/EA	$ 16,861,650.00	
	Resilient Fastener Tie Plate Assembly	224822	EA	$ 50.00	/EA	$ 11,241,100.00	
Rail							
	Demo Existing Rail	913123	TF	$ 46.39	/TF	$ 42,359,775.97	
	Install new Rail	913123	TF	$ 75.00	/TF	$ 68,484,225.00	
	Mechanical Joints	22828	EA	$ 350.00	/EA	$ 7,989,826.25	
Ballast							
	Remove Existing Ballast	913123	TF	$ 58.39	/TF	$ 53,317,251.97	
	Install New Ballast	216175.00	TN	$ 50.00	/TN	$ 10,808,750.00	
Surfacing							
	Surface & Align	913123	LF	$ 46.03	/LF	$ 42,031,051.69	
	Total I:					**$ 258,714,180.88**	$ 258,714,180.88
J	**Rehabilitation of track from class 3 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
Ties							
	Demo Existing Ties	22836	EA	$ 50.00	/EA	$ 1,141,800.00	
	Install New Ties	22836	EA	$ 150.00	/EA	$ 3,425,400.00	
	Resilient Fastener Tie Plate Assembly	45672	EA	$ 50.00	/EA	$ 2,283,600.00	
Rail							
	Demo Existing Rail	109613	TF	$ 46.39	/TF	$ 5,084,947.07	
	Install new Rail	109613	TF	$ 75.00	/TF	$ 8,220,975.00	
Joint Elimination							
	Joint Demo	2803	EA	$ 414.91	/EA	$ 1,162,992.73	
	Thermite Weld	2803	EA	$ 500.00	/EA	$ 1,401,500.00	
Ballast							
	Remove Existing Ballast	109613	TF	$ 58.39	/TF	$ 6,400,303.07	
	Install New Ballast	31140.00	TN	$ 50.00	/TN	$ 1,557,000.00	
Surfacing							
	Surface & Align	219226	LF	$ 46.03	/LF	$ 10,090,972.78	
	Total J:					**$ 40,769,490.65**	$ 40,769,490.65
K	**Rehabilitation of 6.91 miles of track from class 1 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
Ties							
	Demo Existing Ties	44907	EA	$ 50.00	/EA	$ 2,245,330.77	
	Install New Ties	44907	EA	$ 150.00	/EA	$ 6,735,992.31	
	Resilient Fastener Tie Plate Assembly	89813.23077	EA	$ 50.00	/EA	$ 4,490,661.54	
Rail							
	Demo Existing Rail	72970	TF	$ 46.39	/TF	$ 3,385,078.30	
	Install new Rail	72970	TF	$ 75.00	/TF	$ 5,472,750.00	
	Mechanical Joints	1824	EA	$ 350.00	/EA	$ 638,487.50	
Ballast							
	Remove Existing Ballast	72970	TF	$ 58.39	/TF	$ 4,260,718.30	
	Install New Ballast	62190.34	TN	$ 50.00	/TN	$ 3,109,517.05	
Surfacing							
	Surface & Align	72970	LF	$ 46.03	/LF	$ 3,358,809.10	
	Total K:					**$ 33,697,344.86**	$ 33,697,344.86
L	**Rehabilitation of 12 miles of track from class 2 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**	
Ties							
	Demo Existing Ties	77984	EA	$ 50.00	/EA	$ 3,899,176.92	
	Install New Ties	77984	EA	$ 150.00	/EA	$ 11,697,530.77	
	Resilient Fastener Tie Plate Assembly	155967.0769	EA	$ 50.00	/EA	$ 7,798,353.85	
Rail							
	Demo Existing Rail	126720	TF	$ 46.39	/TF	$ 5,878,540.80	
	Install new Rail	126720	TF	$ 75.00	/TF	$ 9,504,000.00	
	Mechanical Joints	3168	EA	$ 350.00	/EA	$ 1,108,800.00	

Alternative 5

Ballast									
	Remove Existing Ballast	126720	TF	$ 58.39	/TF	$ 7,399,180.80			
	Install New Ballast	108000.00	TN	$ 50.00	/TN	$ 5,400,000.00			
Surfacing									
	Surface & Align	126720	LF	$ 46.03	/LF	$ 5,832,921.60			
	Total L:					**$ 58,518,504.74**	$ 58,518,504.74		
M	**Rehabilitation of 28.60 miles of track from class 3 to 4**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Ties									
	Demo Existing Ties	92930	EA	$ 50.00	/EA	$ 4,646,500.00			
	Install New Ties	92930	EA	$ 150.00	/EA	$ 13,939,500.00			
	Resilient Fastener Tie Plate Assembly	185860	EA	$ 50.00	/EA	$ 9,293,000.00			
Rail									
	Demo Existing Rail	151008	TF	$ 46.39	/TF	$ 7,005,261.12			
	Install new Rail	151008	TF	$ 75.00	/TF	$ 11,325,600.00			
Joint Elimination									
	Joint Demo	2803	EA	$ 414.91	/EA	$ 1,162,992.73			
	Thermite Weld	2803	EA	$ 500.00	/EA	$ 1,401,500.00			
Ballast									
	Remove Existing Ballast	151008	TF	$ 58.39	/TF	$ 8,817,357.12			
	Install New Ballast	128700.00	TN	$ 50.00	/TN	$ 6,435,000.00			
Surfacing									
	Surface & Align	302016	LF	$ 46.03	/LF	$ 13,901,796.48			
	Total M:					**$ 77,928,507.45**	$ 77,928,507.45		
N	**State of Good Repair to Remove Slow Orders**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
No Change in Type, Just Align & Ballast									
	Install New Ballast	8353.31	TN	$ 50.00	/TN	$ 417,665.72			
	Surface & Align	88,211.00	LF	$ 46.03	/LF	$ 4,060,352.33			
	Total N:					**$ 4,478,018.05**	$ 4,478,018.05		
O	**Turnout Replacement Package**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
All turnouts located on main tracks to be replaced, including sibling turnouts at crossovers									
	Demolish Existing Turnout	40	EA	$ 52,421.76	/EA	$ 2,096,870.40			
	Install No. 10 Turnout	40	EA	$ 163,767.56	/EA	$ 6,550,702.40			
	Total O:					**$ 8,647,572.80**	$ 8,647,572.80		
P	**Crossing Renewal**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
Every crossing to be rebuilt to meet track class and super									
	Single Track	10	EA	$ 346,392.00	/EA	$ 3,463,920.00			
	Double Track	6	EA	$ 416,588.00	/EA	$ 2,499,528.00			
	Triple Track	1	EA	$ 499,905.60	/EA	$ 499,905.60			
	Speed Update (Single Track)	10	EA	$ 25,000.00	/EA	$ 250,000.00			
	Speed Update (Double Track and Triple Track)	7	EA	$ 50,000.00	/EA	$ 350,000.00			
Replace Rail									
	Demo Existing Ties	32	EA	$ 50.00	/EA	$ 1,600.00			
	Install New Ties	32	EA	$ 150.00	/EA	$ 4,800.00			
	Resilient Fastener Tie Plate Assembly	64	EA	$ 50.00	/EA	$ 3,200.00			
	Demo Existing Rail	750	TF	$ 46.39	/TF	$ 34,792.50			
	Install new Rail	750	TF	$ 75.00	/TF	$ 56,250.00			
	Mechanical Joints	50	EA	$ 350.00	/EA	$ 17,500.00			
	Remove Existing Ballast	750	TF	$ 58.39	/TF	$ 43,792.50			
	Install New Ballast	639	TN	$ 50.00	/TN	$ 31,960.23			
	Surface & Align	750	LF	$ 46.03	/LF	$ 34,522.50			
	Total P:					**$ 7,291,771.33**	$ 7,291,771.33	$ 7,291,771.33	Crossings Subtotal
Q	**Canopy/Brush Cutting**	**Takeoff Qty**		**Unit Price**		**Total Cost**			
	increase visibility on ROW for higher speeds/signal preview								
	Clearing Both Sides of ROW (15' each)	390.18	ACRE	$ 36,000.00	/A	$ 14,046,458.43			
	Total Q:					**$ 14,046,458.43**	$ 14,046,458.43		

Alternative 5

R	**Timber Bridge Deck Ties**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Timber Bridge Deck Ties										
	Required to increase track class	1500	EA	$ 150.00	/EA	$ 225,000.00				
	Total R:					**$ 225,000.00**	$ 225,000.00			
S	**Culvert Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Culvert Replacement										
	Remove & Replace Existing Culvert	6	EA	$ 830,000.00	/LS	$ 4,980,000.00				
	Total S:					**$ 4,980,000.00**	$ 4,980,000.00	$ 667,723,273.02	Track Subtotal	
T	**Layover Facility - North Adams, MA**									
Construct new track										
	Install New Ballast (12" thick)	3666.667	TN	$ 50.00	/TN	$ 183,333.33				
	Install new Rail	5500	TF	$ 75.00	/TF	$ 412,500.00				
	Install New Ties	3385	EA	$ 150.00	/EA	$ 507,750.00				
	Resilient Fastener Tie Plate Assembly	6770	EA	$ 50.00	/EA	$ 338,500.00				
	Flashbutt Welds	142	EA	$ 500.00	/EA	$ 71,000.00				
	Surface & Align	5500	LF	$ 46.03	/LF	$ 253,165.00				
	Install No. 20 Turnout	1	EA	$ 208,527.60	/EA	$ 208,527.60				
	Install No. 10 Turnout	2	EA	$ 163,767.56	/EA	$ 327,535.12				
	Install No. 8 Turnout	3	EA	$ 102,078.23	/EA	$ 306,234.69				
	Bumping Posts	4	EA	$ 3,500.00	/EA	$ 14,000.00				
	Switch Derail	4	EA	$ 3,200.00	/EA	$ 12,800.00				
Replace Northern Track										
	Demo Existing Ties	1650	EA	$ 50.00	/EA	$ 82,500.00				
	Install New Ties	1650	EA	$ 150.00	/EA	$ 247,500.00				
	Resilient Fastener Tie Plate Assembly	3300	EA	$ 50.00	/EA	$ 165,000.00				
	Demo Existing Rail	2680	TF	$ 46.39	/TF	$ 124,325.20				
	Install new Rail	2680	TF	$ 75.00	/TF	$ 201,000.00				
	Joint Demo	69	EA	$ 414.91	/EA	$ 28,628.79				
	Thermite Weld	69	EA	$ 500.00	/EA	$ 34,500.00				
	Remove Existing Ballast	2680	TF	$ 58.39	/TF	$ 156,485.20				
	Install New Ballast	1786.667	TN	$ 50.00	/TN	$ 89,333.33				
Clearing, Grubbing, & Grading for New Tracks										
	Clear & Grub	7.5	A	$ 40,000.00	/A	$ 300,000.00				
	Grading	36550	SY	$ 2.00	/SY	$ 73,100.00				
	Excavation for track subgrade	24368	CY	$ 45.00	/CY	$ 1,096,554.83				
Access Road										
	Rubber Rail Seal	4000	TF	$ 389.30	/TF	$ 1,557,200.00				
	Subbase	2104.61	CY	$ 32.00	/CY	$ 67,347.53				
	Grading	9423.63	SY	$ 2.00	/SY	$ 18,847.26				
	Paving	9423.63	SY	$ 150.00	/SY	$ 1,413,544.17				
	Total T:							$ -	Layover Subtotal	Using the Albany/Rensselaer facility
U	**Bridge Rehabilitations**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Bridge Rehabilitations										
	# of Bridges	97	ea	$ 2,300,000.00	/EA	$ 223,100,000.00	$ 223,100,000.00	$ 429,712,910.00	Bridge Total	
	Total U:					**$ 223,100,000.00**				
V	**Signal Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Signal Replacement										
	Single Track Wayside Signal	12	ea	$ 282,782.00	/EA	$ 3,393,384.00				
	Double Track Wayside Signal	8	ea	$ 378,921.00	/EA	$ 3,031,368.00				
	Tie-In Case Wayside Signal	15	ea	$ 54,895.00	/EA	$ 823,425.00				
	End of Siding Wayside Signal	9	ea	$ 1,142,825.00	/EA	$ 10,285,425.00				
	Modifying Existing Interlocking	1	ea	$ 410,588.00	/EA	$ 410,588.00				
	Convert Electric Lock	13	ea	$ 129,490.00	/EA	$ 1,683,370.00				
	Modify Interlocking - PTC Derail	1	ea	$ 185,248.00	/EA	$ 185,248.00				
	Insulated Joints	104	ea	$ 3,159.72	/EA	$ 328,610.88				
	Total V:					**$ 20,141,418.88**	$ 20,141,418.88	$ 38,794,386.90	Signals Subtotal	
W	**PTC**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
PTC Implementation										
	PTC Implementation	1	LS	$ 45,963,527.00	/EA	$ 45,963,527.00				

Alternative 5

		Total W:			**$ 45,963,527.00**
X	**Station Modification**		**Takeoff Qty**	**Unit Price**	**Total Cost**
	North Adams & Greenfield Lump Sum Station Modification		1 LS	$ 12,000,000.00 /EA	$ 12,000,000.00
		Total X:			**$ 12,000,000.00**
Y	**Salvage Cost for Demo Rail**		**Takeoff Qty**	**Unit Price**	**Total Cost**
	Demo Rail		1713031 TF	$5.85 /LS	$ (10,021,230.82)
		Total Y:			**$ (10,021,230.82)**

Running Total:	**$ 976,219,990.22**
50% Contingency:	**$ 488,109,995.11**
15% Design & Permitting Fees:	**$ 146,432,998.53**
Vehicle Allowance:	**$ 65,000,000.00**
27.61% Escalation:	**$ 287,471,939.81**
Total Cost:	**$ 1,963,234,924**
	$ 2,044,523,516.00

$ 45,963,527.00	$ 88,530,349.35	Signals PTC Subtotal
	$ 127,324,736.26	Signals total
$ 12,000,000.00	$ 23,113,200.00	Stations
	$ 150,437,936.26	Layover + Stations
	$ -	Track total
$ (10,021,230.82)	$ (10,021,230.82)	Track Net of salvage
$ 65,000,000.00	$ 82,946,500.00	
	$ 122,505,600.00	

	Total	50% Contingency	15% D&P	Vehicles	Escalation	**Total**
Track Work	$ 667,723,273.02	$ 333,861,636.51	$ 100,158,490.95		$184,352,688.53	**$ 1,286,096,089.02**
Bridges	$ 223,100,000.00	$ 111,550,000.00	$ 33,465,000.00		$61,596,003.13	**$ 429,711,003.13**
Signals & Grade Xings	$ 73,396,717.21	$ 36,698,358.61	$ 11,009,507.58		$20,264,206.29	**$ 141,368,789.68**
Stations	$ 12,000,000.00	$ 6,000,000.00	$ 1,800,000.00		$3,313,097.43	**$ 23,113,097.43**
Layover	$ -	$ -	$ -		$0.00	**$ -**
Rolling Stock				$65,000,000.00	$17,945,944.43	**$ 82,945,944.43**
Total	$ 976,219,990.23	$ 488,109,995.12	$ 146,432,998.53	$65,000,000.00	$287,471,939.82	**$ 1,963,234,923.70**
	$ (0.01)					

Alternative 6

A	Track Rehabilitation - Fitchburg, MA	Takeoff Qty	Unit Price	Total Cost		
Ties						
	Demo Existing Ties	500 EA	$ 50.00 /EA	$ 25,000.00		
	Install New Ties	500 EA	$ 150.00 /EA	$ 75,000.00		
	Resilient Fastener Tie Plate Assembly	1000 EA	$ 50.00 /EA	$ 50,000.00		
Rail						
	Demo Existing Rail	1000 TF	$ 46.39 /TF	$ 46,390.00		
	Install new Rail	1000 TF	$ 75.00 /TF	$ 75,000.00		
	Mechanical Joints	32 EA	$ 350.00 /EA	$ 11,200.00		
Ballast						
	Remove Existing Ballast	1000 TF	$ 58.39 /TF	$ 58,390.00		
	Install New Ballast	852.27 TN	$ 50.00 /TN	$ 42,613.64		
Surfacing						
	Surface & Align	1000 LF	$ 46.03 /LF	$ 46,030.00		
	Total A:			**$ 429,623.64**	$ 429,623.64	
B	**Track Construction - Westminster, MA**	**Takeoff Qty**	**Unit Price**	**Total Cost**		
Construct new track adjacent to main line						
	Install New Ballast (12" thick)	3900 TN	$ 50.00 /TN	$ 195,000.00		
	Install new Rail	13728 TF	$ 75.00 /TF	$ 1,029,600.00		
	Install New Ties	8450 EA	$ 150.00 /EA	$ 1,267,500.00		
	Resilient Fastener Tie Plate Assembly	16900 EA	$ 50.00 /EA	$ 845,000.00		
	Flashbutt Welds	352 EA	$ 500.00 /EA	$ 176,000.00		
	Surface & Align	20592 LF	$ 46.03 /LF	$ 947,849.76		
Construct retaining wall/slope stabilization for new track						
	CIP Retaining Wall (15" thick)	1910 CY	$ 1,027.60 /CY	$ 1,962,716.00		
	Excavation	9152 CY	$ 25.00 /CY	$ 228,800.00		
	Backfill	4576.00 CY	$ 32.00 /CY	$ 146,432.00		
Modify CPF 335 to accommodate second track						
	#10 Turnout	1 EA	$ 163,767.56 /EA	$ 163,767.56		
	Track Throw	200 LF	$ 42.93 /LF	$ 8,586.00		
Construction new hi-speed Interlocking at CPF 337						
	Equilateral No. 20	1 EA	$ 208,527.60 /EA	$ 208,527.60		
	Access Road	200 SY	$ 125.00 /SY	$ 25,000.00		
	Grading	200 SY	$ 6.50 /SY	$ 1,300.00		
	Surface & Align	200 LF	$ 46.03 /LF	$ 9,206.00		
	Total B:				🟥	Only Applies to High Bookend, not needed here
C	**Track Construction - Charlemont/Rowe, MA**	**Takeoff Qty**	**Unit Price**	**Total Cost**		
Construct new track adjacent to main line						
	Install New Ballast (12" thick)	3300 TN	$ 50.00 /TN	$ 165,000.00		
	Install new Rail	11616 TF	$ 75.00 /TF	$ 871,200.00		
	Install New Ties	7150 EA	$ 150.00 /EA	$ 1,072,546.15		
	Resilient Fastener Tie Plate Assembly	14300.61538 EA	$ 50.00 /EA	$ 715,030.77		
	Flashbutt Welds	298 EA	$ 500.00 /EA	$ 149,000.00		
	Surface & Align	20592 LF	$ 46.03 /LF	$ 947,849.76		
Construct retaining wall/slope stabilization for new track						
	CIP Retaining Wall (15" thick)	1613.3 CY	$ 1,027.60 /CY	$ 1,657,861.33		
	Excavation	6453.3 CY	$ 25.00 /CY	$ 161,333.33		
	Backfill	3872.0 CY	$ 32.00 /CY	$ 123,904.00		
Modify Existing CPF 415 to accommodate second track						
	#10 Turnout	1 EA	$ 163,767.56 /EA	$ 163,767.56		
	Track Throw	200 LF	$ 42.93 /LF	$ 8,586.00		
Construction new hi-speed Interlocking at CPF 411						
	Equilateral No. 20	1 EA	$ 87,430.00 /EA	$ 87,430.00		
	Access Road	200 SY	$ 125.00 /SY	$ 25,000.00		
	Grading	200 SY	$ 6.50 /SY	$ 1,300.00		
	Surface & Align	200 LF	$ 46.03 /LF	$ 9,206.00		
	Total C:				🟥	Only Applies to High Bookend, not needed here
D	**Rehabilitation of track from class 1 to 3**	**Takeoff Qty**	**Unit Price**	**Total Cost**		
Ties						
	Demo Existing Ties	4150 EA	$ 50.00 /EA	$ 207,500.00		
	Install New Ties	4150 EA	$ 150.00 /EA	$ 622,500.00		

Alternative 6

	Resilient Fastener Tie Plate Assembly	8300	EA	$	50.00	/EA	$	415,000.00			
Rail											
	Demo Existing Rail	13693.58	TF	$	46.39	/TF	$	635,245.18			
	Install new Rail	13693.58	TF	$	75.00	/TF	$	1,027,018.50			
	Mechanical Joints	352	EA	$	350.00	/EA	$	123,200.00			
Ballast											
	Remove Existing Ballast	13693.58	TF	$	58.39	/TF	$	799,568.14			
	Install New Ballast	11670.66	TN	$	50.00	/TN	$	583,533.24			
Surfacing											
	Surface & Align	41080.74	LF	$	46.03	/LF	$	1,890,946.46			
	Total D:						**$**	**6,304,511.51**	$ 6,304,511.51		
E	**Rehabilitation of track from class 2 to 3**	**Takeoff Qty**			**Unit Price**		**Total Cost**				
Ties											
	Demo Existing Ties	39355	EA	$	50.00	/EA	$	1,967,750.00			
	Install New Ties	39355	EA	$	150.00	/EA	$	5,903,250.00			
	Resilient Fastener Tie Plate Assembly	78710	EA	$	50.00	/EA	$	3,935,500.00			
Rail											
	Demo Existing Rail	207791.33	TF	$	46.39	/TF	$	9,639,439.80			
	Install new Rail	207791.33	TF	$	75.00	/TF	$	15,584,349.75			
	Mechanical Joints	5328	EA	$	350.00	/EA	$	1,864,800.00			
Ballast											
	Remove Existing Ballast	207791.33	TF	$	58.39	/TF	$	12,132,935.76			
	Install New Ballast	98386.05	TN	$	50.00	/TN	$	4,919,302.32			
Surfacing											
	Surface & Align	415,582.66	LF	$	46.03	/LF	$	19,129,269.84			
	Total E:						**$**	**75,076,597.47**	$ 75,076,597.47		
F	**Rehabilitation of 10.86 miles of track from class 1 to 4**	**Takeoff Qty**			**Unit Price**		**Total Cost**				
Ties											
	Demo Existing Ties	17376	EA	$	50.00	/EA	$	868,800.00			
	Install New Ties	17376	EA	$	150.00	/EA	$	2,606,400.00			
	Resilient Fastener Tie Plate Assembly	34752	EA	$	50.00	/EA	$	1,737,600.00			
Rail											
	Demo Existing Rail	114682	TF	$	46.39	/TF	$	5,320,097.98			
	Install new Rail	114682	TF	$	75.00	/TF	$	8,601,150.00			
	Mechanical Joints	2867	EA	$	350.00	/EA	$	1,003,467.50			
Ballast											
	Remove Existing Ballast	114682	TF	$	58.39	/TF	$	6,696,281.98			
	Install New Ballast	48870.00	TN	$	50.00	/TN	$	2,443,500.00			
Surfacing											
	Surface & Align	172022	LF	$	46.03	/LF	$	7,918,172.66			
	Total F:						**$**	**37,195,470.12**	$ 37,195,470.12		
G	**Rehabilitation of track from class 2 to 4**	**Takeoff Qty**			**Unit Price**		**Total Cost**				
Ties											
	Demo Existing Ties	112411	EA	$	50.00	/EA	$	5,620,550.00			
	Install New Ties	112411	EA	$	150.00	/EA	$	16,861,650.00			
	Resilient Fastener Tie Plate Assembly	224822	EA	$	50.00	/EA	$	11,241,100.00			
Rail											
	Demo Existing Rail	913123	TF	$	46.39	/TF	$	42,359,775.97			
	Install new Rail	913123	TF	$	75.00	/TF	$	68,484,225.00			
	Mechanical Joints	22828	EA	$	350.00	/EA	$	7,989,826.25			
Ballast											
	Remove Existing Ballast	913123	TF	$	58.39	/TF	$	53,317,251.97			
	Install New Ballast	216175.00	TN	$	50.00	/TN	$	10,808,750.00			
Surfacing											
	Surface & Align	913123	LF	$	46.03	/LF	$	42,031,051.69			
	Total G:						**$**	**258,714,180.88**	$ 258,714,180.88		
H	**Rehabilitation of track from class 3 to 4**	**Takeoff Qty**			**Unit Price**		**Total Cost**				
Ties											
	Demo Existing Ties	22836	EA	$	50.00	/EA	$	1,141,800.00			
	Install New Ties	22836	EA	$	150.00	/EA	$	3,425,400.00			

Alternative 6

	Resilient Fastener Tie Plate Assembly	45672	EA	$ 50.00	/EA	$ 2,283,600.00				
Rail										
	Demo Existing Rail	109613	TF	$ 46.39	/TF	$ 5,084,947.07				
	Install new Rail	109613	TF	$ 75.00	/TF	$ 8,220,975.00				
Joint Elimination										
	Joint Demo	2803	EA	$ 414.91	/EA	$ 1,162,992.73				
	Thermite Weld	2803	EA	$ 500.00	/EA	$ 1,401,500.00				
Ballast										
	Remove Existing Ballast	109613	TF	$ 58.39	/TF	$ 6,400,303.07				
	Install New Ballast	31140.00	TN	$ 50.00	/TN	$ 1,557,000.00				
Surfacing										
	Surface & Align	219226	LF	$ 46.03	/LF	$ 10,090,972.78				
	Total H:					**$ 40,769,490.65**	$ 40,769,490.65			
I	**State of Good Repair to Remove Slow Orders**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
No Change in Type, Just Align & Ballast										
	Install New Ballast	8353.31	TN	$ 50.00	/TN	$ 417,665.72				
	Surface & Align	88,211.00	LF	$ 46.03	/LF	$ 4,060,352.33				
	Total I:					**$ 4,478,018.05**	$ 4,478,018.05			
J	**Turnout Replacement Package**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
All turnouts located on main tracks to be replaced, including sibling turnouts at crossovers										
	Demolish Existing Turnout	40	EA	$ 52,421.76	/EA	$ 2,096,870.40				
	Install No. 10 Turnout	40	EA	$ 163,767.56	/EA	$ 6,550,702.40				
	Total J:					**$ 8,647,572.80**	$ 8,647,572.80			
K	**Crossing Renewal**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Every crossing to be rebuilt to meet track class and super										
	Single Track	10	EA	$ 346,392.00	/EA	$ 3,463,920.00				
	Double Track	6	EA	$ 416,588.00	/EA	$ 2,499,528.00				
	Triple Track	1	EA	$ 499,905.60	/EA	$ 499,905.60				
	Speed Update (Single Track)	10	EA	$ 25,000.00	/EA	$ 250,000.00				
	Speed Update (Double Track and Triple Track)	7	EA	$ 50,000.00	/EA	$ 350,000.00				
Replace Rail										
	Demo Existing Ties	32	EA	$ 50.00	/EA	$ 1,600.00				
	Install New Ties	32	EA	$ 150.00	/EA	$ 4,800.00				
	Resilient Fastener Tie Plate Assembly	64	EA	$ 50.00	/EA	$ 3,200.00				
	Demo Existing Rail	750	TF	$ 46.39	/TF	$ 34,792.50				
	Install new Rail	750	TF	$ 75.00	/TF	$ 56,250.00				
	Mechanical Joints	50	EA	$ 350.00	/EA	$ 17,500.00				
	Remove Existing Ballast	750	TF	$ 58.39	/TF	$ 43,792.50				
	Install New Ballast	639	TN	$ 50.00	/TN	$ 31,960.23				
	Surface & Align	750	LF	$ 46.03	/LF	$ 34,522.50				
	Total K:					**$ 7,291,771.33**	$ 7,291,771.33		$ 7,291,771.33	Crossings Subtotal
L	**Canopy/Brush Cutting**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
	increase visibility on ROW for higher speeds/signal preview									
	Clearing Both Sides of ROW (15' each)	390.18	ACRE	$ 36,000.00	/A	$ 14,046,458.43				
	Total L:					**$ 14,046,458.43**	$ 14,046,458.43			
M	**Timber Bridge Deck Ties**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Timber Bridge Deck Ties										
	Required to increase track class	1500	EA	$ 150.00	/EA	$ 225,000.00				
	Total M:					**$ 225,000.00**	$ 225,000.00			
N	**Culvert Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**				
Culvert Replacement										
	Remove & Replace Existing Culvert	6	EA	$ 830,000.00	/LS	$ 4,980,000.00				
	Total N:					**$ 4,980,000.00**	$ 4,980,000.00			
							$ 450,866,923.55		$ 868,414,781.44	Track subtotal

Alternative 6

O	**Layover Facility - North Adams, MA**										
Construct new track											
	Install New Ballast (12" thick)	3666.667	TN	$ 50.00	/TN	$ 183,333.33					
	Install new Rail	5500	TF	$ 75.00	/TF	$ 412,500.00					
	Install New Ties	3385	EA	$ 150.00	/EA	$ 507,750.00					
	Resilient Fastener Tie Plate Assembly	6770	EA	$ 50.00	/EA	$ 338,500.00					
	Flashbutt Welds	142	EA	$ 500.00	/EA	$ 71,000.00					
	Surface & Align	5500	LF	$ 46.03	/LF	$ 253,165.00					
	Install No. 20 Turnout	1	EA	$ 208,527.60	/EA	$ 208,527.60					
	Install No. 10 Turnout	2	EA	$ 163,767.56	/EA	$ 327,535.12					
	Install No. 8 Turnout	3	EA	$ 102,078.23	/EA	$ 306,234.69					
	Bumping Posts	4	EA	$ 3,500.00	/EA	$ 14,000.00					
	Switch Derail	4	EA	$ 3,200.00	/EA	$ 12,800.00					
Replace Northern Track											
	Demo Existing Ties	1650	EA	$ 50.00	/EA	$ 82,500.00					
	Install New Ties	1650	EA	$ 150.00	/EA	$ 247,500.00					
	Resilient Fastener Tie Plate Assembly	3300	EA	$ 50.00	/EA	$ 165,000.00					
	Demo Existing Rail	2680	TF	$ 46.39	/TF	$ 124,325.20					
	Install new Rail	2680	TF	$ 75.00	/TF	$ 201,000.00					
	Joint Demo	69	EA	$ 414.91	/EA	$ 28,628.79					
	Thermite Weld	69	EA	$ 500.00	/EA	$ 34,500.00					
	Remove Existing Ballast	2680	TF	$ 58.39	/TF	$ 156,485.20					
	Install New Ballast	1786.667	TN	$ 50.00	/TN	$ 89,333.33					
Clearing, Grubbing, & Grading for New Tracks											
	Clear & Grub	7.5	A	$ 40,000.00	/A	$ 300,000.00					
	Grading	36550	SY	$ 2.00	/SY	$ 73,100.00					
	Excavation for track subgrade	24368	CY	$ 45.00	/CY	$ 1,096,554.83					
Access Road											
	Rubber Rail Seal	4000	TF	$ 389.30	/TF	$ 1,557,200.00					
	Subbase	2104.61	CY	$ 32.00	/CY	$ 67,347.53					
	Grading	9423.63	SY	$ 2.00	/SY	$ 18,847.26					
	Paving	9423.63	SY	$ 150.00	/SY	$ 1,413,544.17					
	Total O:					**$ 8,291,212.04**	$ 8,291,212.04		$ 15,969,703.51	Layover Subtotal	$ 15,969,703.51
P	**Bridge Rehabilitations**	**Takeoff Qty**		**Unit Price**		**Total Cost**					
Bridge Rehabilitations											
	# of Bridges	97	ea	$ 2,300,000.00	/EA	$ 223,100,000.00					
	Total P:					**$ 223,100,000.00**	$ 223,100,000.00		$ 429,712,910.00	Bridge	$429,712,910.00
Q	**Signal Replacement**	**Takeoff Qty**		**Unit Price**		**Total Cost**					
Signal Replacement											
	Single Track Wayside Signal	12	ea	$ 282,782.00	/EA	$ 3,393,384.00					
	Double Track Wayside Signal	8	ea	$ 378,921.00	/EA	$ 3,031,368.00					
	Tie-In Case Wayside Signal	15	ea	$ 54,895.00	/EA	$ 823,425.00					
	End of Siding Wayside Signal	9	ea	$ 1,142,825.00	/EA	$ 10,285,425.00					
	Modifying Existing Interlocking	1	ea	$ 410,588.00	/EA	$ 410,588.00					
	Convert Electric Lock	13	ea	$ 129,490.00	/EA	$ 1,683,370.00					
	Modify Interlocking - PTC Derail	1	ea	$ 185,248.00	/EA	$ 185,248.00					
	Insulated Joints	104	ea	$ 3,159.72	/EA	$ 328,610.88					
	Total Q:					**$ 20,141,418.88**	$ 20,141,418.88		$ 38,794,386.90	Signals Subtotal	$ 38,794,386.90
R	**PTC**	**Takeoff Qty**		**Unit Price**		**Total Cost**					
PTC Implementation											
	PTC Implementation	1	LS	$ 45,963,527.00	/EA	$ 45,963,527.00					
	Total R:					**$ 45,963,527.00**	$ 45,963,527.00		$ 88,530,349.35	Signals PTC Subtotal	$ 88,530,349.35
									$ 127,324,736.26	Signals total	$127,324,736.26
S	**Station Modification**	**Takeoff Qty**		**Unit Price**		**Total Cost**					
North Adams & Greenfield Lump Sum											
	Station Modification	1	LS	$ 12,000,000.00	/EA	$ 12,000,000.00					
Athol Lump Sum											
	Station Modification	1	LS	$ 6,000,000.00	/EA	$ 6,000,000.00					
	Total S:					**$ 18,000,000.00**	$ 18,000,000.00		$ 34,669,800.00	Stations	$ 34,669,800.00
									$ 50,639,503.51	Layover + Stations Total	
T	**Salvage Cost for Demo Rail**	**Takeoff Qty**		**Unit Price**		**Total Cost**					

Alternative 6

Demo Rail	1363333 TF	$5.85 /LS	$	(7,975,497.52)
Total T:			**$**	**(7,975,497.52)**

		$ 868,414,781.44	Track total
$ (7,975,497.52)		$ 860,439,283.92	Track Net of salvage Total
		$ 442,891,426.02	

Running Total:	**$**	**765,679,355.27**
50% Contingency:	**$**	**382,839,677.64**
15% Design & Permitting Fees:	**$**	**114,851,903.29**
Vehicle Allowance:	**$**	**65,000,000.00**
27.61% Escalation:	**$**	**229,343,470.03**
Total Cost:	**$**	**1,557,714,406**

$ 758,387,583.94

$ 65,000,000.00	$ 82,946,500.00
	$ 122,505,600.00

2.034421

1623033366

		Total	50% Contingency	15% D&P	Vehicles	Escalation	**Total**
1	Track Work	$ 442,891,426.02	$ 221,445,713.01	$ 66,433,713.90		$122,278,537.26	**$ 853,049,390.19**
0.5	Bridges	$ 223,100,000.00	$ 111,550,000.00	$ 33,465,000.00		$61,596,003.13	**$ 429,711,003.13**
0.15	Signals & Grade Xings	$ 73,396,717.21	$ 36,698,358.60	$ 11,009,507.58		$20,264,206.29	**$ 141,368,789.68**
0.2761	Stations	$ 18,000,000.00	$ 9,000,000.00	$ 2,700,000.00		$4,969,646.15	**$ 34,669,646.15**
0.9261	Layover	$ 8,291,212.04	$ 4,145,606.02	$ 1,243,681.81		$2,289,132.78	**$ 15,969,632.64**
	Rolling Stock				$65,000,000.00	$17,945,944.43	**$ 82,945,944.43**
	Total	$ 765,679,355.27	$ 382,839,677.64	$ 114,851,903.29	$65,000,000.00	$229,343,470.03	**$ 1,557,714,406.23**

Appendix F

Benefit-Cost Analysis

NORTHERN TIER PASSENGER RAIL STUDY: BENEFIT-COST ANALYSIS

1 EXECUTIVE SUMMARY

The Massachusetts Department of Transportation is exploring the development of passenger rail service along the Route 2 corridor between North Adams and Boston ("The Project"). The US Department of Transportation (USDOT)[1] defines a Benefit-Cost Analysis (BCA) as a tool for identifying, quantifying, and comparing expected benefits and costs of an investment, action, or policy. This approach for analyzing a proposed project is a required element for many discretionary USDOT grant programs.

Table 1 summarizes the estimated costs and benefits of the proposed six Northern Tier Passenger Rail (NTPR) alternatives. The benefit-cost ratios (BCRs) for these project alternatives range from -0.10 to -0.44 and have a Net Present Values (NPVs) ranging from -$781 million to - $1.87 billion. Alternative 1, the lowest-cost alternative, has the highest Net Present Value.

Table 1: Modified BCA Summary, millions of 2021 dollars (discounted at 7 percent unless otherwise stated)

BCA Metric	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5
Safety Benefits	$2.3	$3.8	$6.1	$6.2	$3.8	$0.1
Avoided Road Wear and Tear	~$0.0	$0.1	$0.1	$0.1	$0.1	~$0.0
Avoided Congestion	$2.0	$3.3	$5.4	$5.4	$3.3	$0.1
Avoided Emissions (except CO_2)	- $0.2	- $0.1	$0.1	- $0.1	- $0.2	- $0.1
Avoided Emissions (CO_2 only)*	$0.8	$1.3	$2.4	$2.2	$1.3	~$0.0
Property Value Increase	$21.9	$20.5	$27.9	$42.6	$20.5	$31.9
Total Benefits	- $238.8	- $209.5	- $164.5	- $167.0	- $358.7	- $150.6
Total Costs	$542.1	$941.7	$1,701.3	$953.4	$1,177.8	$964.5
NPV	- $780.9	- $1,151.2	- $1,865.8	- $1,120.4	- $1,536.5	- $1,115.1
BCR	- 0.44	- 0.22	- 0.10	- 0.18	- 0.30	- 0.16
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5

* Discounted at 3% rate

As discussed in this analysis, the main driver for the BCR is the relationship between the projected ridership levels and the estimated operating and maintenance (O&M) and capital investment costs.

2 INTRODUCTION

The Massachusetts Department of Transportation is examining the benefits, costs, and investments necessary to implement passenger rail service from North Adams to Greenfield and Boston roughly parallel to the Route 2 corridor ("the Project"). This service would link communities and surrounding areas currently not connected to the Boston area. This Benefit-Cost Analysis (BCA) compares the estimated costs with the benefits of such an investment. This appendix is organized as follows:

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[1] https://www.transportation.gov/grants/dot-navigator/what-is-a-benefit-cost-analysis

- Section 3 contains the Project description.
- Section 4 documents the BCA methodology, including key methodological components, assumptions, and the study scenarios.
- Section 5 provides ridership projections and the underlying assumptions.
- Section 6 contains a detailed explanation and calculation of the Project benefits.
- Section 7 contains a detailed explanation and calculation of the Project costs.
- Section 8 contains the detailed results of the BCA.
- Section 9 contains the sensitivity analysis under a reduced-cost scenario.

The US Department of Transportation (USDOT) defines a Benefit-Cost Analysis (BCA) as a tool for identifying, quantifying, and comparing expected benefits and costs of an investment, action, or policy. This framework for analyzing a proposed project is a required element for many discretionary USDOT grant programs; the purpose of this document is to help assess the competitiveness of the Project for these federal funds.

For example, a Benefit-Cost Ratio (BCR) below 1.0 (a BCR of 1.0 would indicate a project where the benefits and costs are equivalent) may indicate the need for rescoping the project, applying for a sub-component likely to have a higher BCR, or changing the development approach. A planning grant – which typically does not require a BCA – could be sought to support those efforts.

3 PROJECT DESCRIPTION

Service between Western Massachusetts and Boston along the Route 2 corridor ran for decades before being discontinued in the middle part of the 20th century. There is interest among stakeholders in the corridor to restore service to better connect to the economic, medical, recreational, and other resources statewide, in addition to increasing mobility options and enhancing safety.

This BCA considers six service alternatives outlined in Table 2. The alternatives present distinct levels of service contingent on varying approaches to the NTPR service. A key factor in developing this BCA is the overall travel time between stations. The total travel time ranges between nearly four hours in the "Lower Investment" alternative 1 to two hours, forty-eight minutes in the "Higher Investment" alternative 2.

Table 2 List of Alternatives

Alternative	Stops	Electrified	Trips per direction	Maximum Speeds[2]	North Adams to Boston Run Time (HH:MM)
1 – Lower Investment	North Adams, Greenfield, Fitchburg, North Station	No	5 per day	60/80 mph	3:55
2 – Higher Investment	North Adams, Greenfield, Fitchburg, North Station	No	5 per day	60/80 mph	2:48
3 – Electrified Service	North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter Square, North Station	Yes	5 per day	60/80 mph	2:50
4 – Full Local Service	North Adams, Shelburne Falls, Greenfield, Athol, Gardner, Fitchburg, Porter Square, North Station	No	5 per day	60/80 mph	2:59
5 – Albany Extension / Albany Connector	Albany (NY), Schenectady (NY), North Adams, Greenfield, Fitchburg, Porter Square, North Station	No	5 per day	60/80 mph	2:49
6 – North Adams to Fitchburg with Transfer	North Adams, Greenfield, Athol, Fitchburg (connection to MBTA)	No	5 per day	60/80 mph	3:22

4 BENEFIT COST ANALYSIS FRAMEWORK

The BCA provides an evaluation framework to assess the economic advantages (benefits) and disadvantages (costs) of a potential infrastructure project. Project benefits and costs are broadly defined and are quantified in monetary terms to the extent possible. Benefits include considerations such as increasing mobility (e.g., reduced overall travel time), decreasing greenhouse gas emissions, or increasing real estate values. Costs are typically the capital costs to deliver a project, although any negative impacts from a project (e.g., increased crash risk) should also be considered in an analysis.

The BCA framework involves defining a Base or "No Build" scenario, which is compared to the "Build" scenario. The No Build scenario is the continuation of the status quo where the proposed investment is not made. The BCA assesses the incremental difference between the "Build" scenario and the "No Build" scenario, which represents the net change. BCAs are forward-looking exercises which seek to assess the incremental change over a project life cycle.

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[2] The corridor has a maximum speed of 79 mph in the MBTA territory and 60 mph in the Pan Am Southern territory across all six alternatives.

4.1 KEY METHODOLOGICAL COMPONENTS

The Project BCA is conducted in accordance with the methodology recommended by the USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs.[3]

The methodology includes the following key components:

- Defining existing and future conditions under the “No Build” (Base) scenario as well as under the “Build” scenario.
- Assessing the Project benefits with respect to each of the primary selection criteria defined by the USDOT over the 30 years of operations beyond the Project completion when benefits accrue and using USDOT recommended values to monetize benefits when available. Recommended monetization rates were used for auto vehicle operating costs, net crash costs, congestion costs, and greenhouse gas (GHG) emission costs. Other benefits and disbenefits were quantified by relying on other industry best practices.
- Estimating the Project capital costs during Project implementation and Project operating and maintenance (O&M) costs over the 30 years of operations beyond the Project completion when benefits accrue.
- Discounting Project benefits and costs consistent with USDOT BCA Guidance using a real discount rate of seven percent, except in the case of CO_2 emissions, which are discounted at a three-percent rate (also as per USDOT BCA Guidance).

Discounting

Discounting reflects that people prefer consumption today to future consumption, and that invested capital is productive and provides greater consumption in the future. Properly applied, discounting can tell us how much future benefits and costs are worth today. For example, $1,000,000 thirty years from now has a present value of approximately $130,000 today when discounted at 7 percent per year.

4.2 KEY ASSUMPTIONS

The assessment of the Project benefits and costs associated with the Northern Tier project involves the following key assumptions:

- The evaluation period includes the design, engineering, and construction of the Project during which capital expenditures are undertaken (Project Implementation Period), plus 30 years of operations beyond the Project completion within which to evaluate ongoing benefits and costs (Project Operating Period).
- This analysis uses 2023 as “Year 1” for construction of the project and all costs and benefits are expressed in 2023 dollars. However, this should not be construed as a commitment by MassDOT

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[3] https://www.transportation.gov/sites/dot.gov/files/2023-01/Benefit%20Cost%20Analysis%20Guidance%202023%20Update.pdf

to begin construction in 2023 or any other year. The Project Implementation Period for this analysis is the following for each of the *Northern Tier* six alternatives:

  - Alternative 1 (“Lower Investment”): 2023-2025
  - Alternative 2 (“Higher Investment”): 2023-2026
  - Alternative 3 (“Electrified Service”): 2023-2027
  - Alternative 4 (“Full Local Service”): 2023-2026
  - Alternative 5 (“Albany Extension / Albany Connector”): 2023-2026
  - Alternative 6 (“Fitchburg transfer to MBTA Commuter Rail”): 2023-2025

- The Project Operating Period consists of thirty years following each Implementation period stated above. Project benefits begin in the calendar year immediately following final construction.
  - Alternative 1 (“Lower Investment”): 2026-2055
  - Alternative 2 (“Higher Investment”): 2027-2056
  - Alternative 3 (“Electrified Service”): 2028-2057
  - Alternative 4 (“Full Local Service”): 2027-2056
  - Alternative 5 (“Albany Extension / Albany Connector”): 2027-2056
  - Alternative 6 (“Fitchburg transfer to MBTA Commuter Rail”): 2026-2055
- Since most benefits are calculated on a per-passenger-mile-traveled (PMT) basis, one core assumption is that PMT levels remain constant for each alternative during the entirety of the Operating Period. This assumption is consistent with employment and population projections along the corridor.
- In the absence of the project, it is assumed that potential riders will rely on private vehicles instead, using an average occupancy rate of 1.67 passengers per car, as per USDOT BCA Guidance.[3]
- All Project benefits and costs are conservatively assumed to occur at the end of each calendar year for the purposes of present value discounting.
- Monetary values of Project costs and benefits are expressed in constant 2021 dollars (or 2021 dollars). In instances where Project cost estimates are obtained in historical dollar years other than 2021 dollars, the analysis uses the appropriate U.S. Bureau of Labor Statistics (BLS)

Consumer Price Index (CPI)[4] to adjust the values. Annual CPI averages are used for the defined 2021 dollars and for other years for which more specific dates are not available. Otherwise, monthly CPI values are applied according to the source of the value that needs to be converted to 2021 dollars.

4.3 "BUILD" AND "NO BUILD" SCENARIOS

The analysis of the Project assessed the balance between costs and benefits resulting from the construction of the Project, including the long-term benefits to both users and non-users. This is accomplished by comparing the "Build" scenario relative to the "No Build" scenario.

The "No Build" (Base) scenario would consist of not implementing any of the six Northern Tier rail alternatives. No benefits or costs are assumed for this scenario.

The "Build" scenarios would entail the completion of any of the six Northern Tier rail alternatives, each analyzed individually. Each scenario would include the capital costs associated with construction until the Project is completed, then routine operational and maintenance costs once the rail line is operated over the 30-year Operating Period. Except for property value increases, all the benefits are shown as avoided costs relative to the "No Build" scenario.

5 RIDERSHIP PROJECTIONS

Ridership projections provided the estimated annual number of unlinked passenger trips (UPT) for each origin-destination (O-D) pair. Total mileage and travel times between O-D pairs was used to estimate passenger miles traveled (PMT) and passenger hours traveled (PHT). For this BCA, PHT were not used since no significant differences in travel times are expected between the "Build" and "No Build" (private vehicles) scenarios. Each alternative's annual PMT was calculated by multiplying each O-D pair mileage by the same O-D pair annual UPT, and then by adding these results for all involved O-D pairs under each alternative. Annual PMT by alternative are shown in Table 3.

Table 3: Annual PMT by Alternative

Alternative	Annual PMT
Alternative 1 – "Lower Investment"	3,297,137
Alternative 2 – "Higher Investment"	5,724,267
Alternative 3 – "Electrified Service"	10,020,074
Alternative 4 – "Full Local Service"	9,406,889
Alternative 5 – "Albany Extension / Albany Connector"	5,651,343
Alternative 6 – "Fitchburg Transfer to MBTA Commuter Rail"	70,377

Source: Cambridge Systematics, Inc.

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[4] https://www.bls.gov/cpi/

6 PROJECT BENEFITS

Project benefits included safety, avoided road wear and tear, avoided congestion, avoided emissions, and property value increases near the proposed station areas. These benefits are described in more detail below.

6.1 SAFETY BENEFITS

The benefits of traveling by rail instead of by personal vehicle are translated into monetary equivalents for the analysis. The safety benefits assessed in this analysis are based on avoided auto crashes resulting from the avoided auto VMT (Vehicle Miles Traveled) due to the Northern Tier rail alternatives (i.e., people taking the train rather than driving). Safety benefits result from the reduction in the number of predicted annual crashes from the "Build" scenario relative to the "No-Build" scenario. The estimation of these benefits involved the following:

- **Auto:** Obtaining historical auto crash rates at the county level for the different segments. These crashes represent the "No Build" scenario.
  - When a segment goes through multiple counties, an average of the involved counties' crash rates was used.
  - A 5-year period was analyzed to estimate the average number of annual crashes and their severity.
  - Crash data broken down at the fatal, injury, and property damage-only (PDO) crashes was available for MA counties for the June 2018 - May 2023 period,[5] and for NY counties for the January 2017 - December 2021 period.[6]
  - Crashes were then annualized by the timeframes shown above, expressed in years.
  - In order to normalize crashes by VMT and obtain crash rates per PMT, county VMT data was estimated using 2017 Local Area Transportation Characteristics (LATCH) individual daily VMT by county,[7] multiplied by 365 (to convert daily data to annual data), and then by the 2018 5-Year American Communities Survey (ACS) population estimates (to apply individual averages to the aggregate county population counts).[8]
  - Resulting fatal, injury, and PDO crash rates were obtained for each county.

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[5] massdot-impact-crashes-vhb.opendata.arcgis.com
[6] data.ny.gov
[7] https://www7.bts.dot.gov/latch/latch-data
[8] U.S. Census Bureau, 2018 5-Year ACS Estimates, Table B01003.

  - Counties' crash rates were assigned to each segment of each alternative, according to the counties that would be driven through in each segment in the "No Build" scenario.
  - Northern Tier annual rail PMT were divided by the suggested average vehicle occupancy (AVO) for all travel purposes equal to 1.67[3] to obtain the number of annual VMT for each segment under the "No Build" scenario.
  - Each crash type rate per VMT was multiplied by its corresponding VMT and summarized by alternative. This resulted in an estimated number of annual crashes of each type.
  - Annual crashes were monetized at their corresponding monetization rate as per USDOT BCA Guidance: $13,046,800 per fatal crash, $307,800 per injury crash, and $4,800 per vehicle involved in a PDO crash, in 2021 dollars.[3] An annual crash savings rate per PMT was obtained for each alternative. Table 4 shows these findings.

- **Rail:** Obtaining historical rail crash rates for the area. These crashes represent the "Build" scenario.
  - 2017-2022 Form 55a data from the Federal Railroad Administration (FRA) was obtained for the MBTA. This includes a record of killed and injured persons in each accident, as well as a sum of property damage incurred.[9]
  - Annual PMT statistics were obtained from annual MBTA profiles reported to the National Transit Database (NTD) to normalize each year's fatalities, injuries, and property damage by the number of PMT.[10]
  - Fatal victim, injured person, and property damage amount rates per PMT were obtained using the 5-year long series.
  - Fatal victims were monetized using USDOT BCA Guidance "K – Killed" associated cost of $11,800,000, while injured persons were monetized using the "U – Injured" category instead, worth $213,900.[3]
  - A resulting overall crash cost per PMT was obtained, equal to $0.0081 and shown in Table 5.

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[9] https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/AccidentByStateRailroadSQL.aspx

[10] https://www.transit.dot.gov/ntd/transit-agency-profiles/massachusetts-bay-transportation-authority

Table 4: Crash Costs under the "No Build" Scenario

Alternative	Annual Avoided Fatal Crashes	Annual Avoided Injury Crashes	Annual Fewer Vehicles Involved in PDO Crashes	Annual Savings from Avoided Crashes	Average Annual Savings per alternative PMT
Alternative 1	0.0072	0.5326	3.1433	$273,552	$0.083
Alternative 2	0.0133	0.9119	5.3443	$479,595	$0.084
Alternative 3	0.0217	1.6070	9.4944	$823,693	$0.082
Alternative 4	0.0190	1.3917	8.2607	$715,454	$0.083
Alternative 5	0.0131	0.9023	5.3159	$473,760	$0.084
Alternative 6	0.0002	0.0115	0.0694	$6,391	$0.091

Source: Cambridge Systematics, Inc.

Table 5: Crash Costs under the "Build" Scenario

Year	Killed (MBTA)	Injured (MBTA)	Property Damage (MBTA)	PMT (MBTA)	Fatal Rate	Injury Rate	PDO Rate
2017	2	3	$342,392	697,665,040	0.0000000029	0.0000000043	0.0004907685
2018	0	0	$374,686	680,949,680	—	—	0.0005502404
2019	0	3	$569,388	653,570,994	—	0.0000000046	0.0008711953
2020	0	0	$51,253	513,830,968	—	—	0.0000997468
2021	0	0	$429,887	155,056,157	—	—	0.0027724600
Average Crash Rate					0.0000000006	0.0000000018	0.0009568822
Average Monetized Crash Cost Rate					$0.0068	$0.0004	$0.0010
Total Average Monetized Crash Cost Rate (All Crash Types)							**$0.0081**

Source: Cambridge Systematics, Inc.

Table 6 presents the safety benefits for all alternatives in undiscounted 2021 dollars. These benefits result from the annual difference between each alternative's PMT multiplied by the auto crash cost and the same PMT multiplied by the rail crash cost.

Table 6: Safety (Avoided Crash Costs) Benefits by Alternative, undiscounted 2021 dollars

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2026	$246,836	—	—	—	—	$5,821
2027	$246,836	$433,213	—	$705,600	$427,969	$5,821
2028	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2029	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2030	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2031	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2032	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2033	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2034	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2035	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2036	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2037	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2038	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2039	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2040	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2041	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2042	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2043	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2044	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2045	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2046	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2047	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2048	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2049	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2050	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2051	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2052	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2053	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2054	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2055	$246,836	$433,213	$742,505	$705,600	$427,969	$5,821
2056	—	$433,213	$742,505	$705,600	$427,969	—
2057	—	—	$742,505	—	—	—

Source: Cambridge Systematics, Inc.

6.2 AVOIDED ROAD WEAR AND TEAR BENEFITS

The annual cost of maintaining the highway system in a state of good repair is lowered as more highway traffic shifts to transit and reduces roadway travel. The quantification of these benefits typically focuses on pavement maintenance costs.

Changes in VMT, whether increasing or decreasing, impact the condition of pavement over time. A decrease in VMT would lead to improved pavement conditions by reducing the wear and tear caused by automobiles. In contrast, an increase in VMT would lead to increased pavement maintenance costs. The assessment of the state of good repair (SOGR) of the roadway infrastructure benefits involves multiple steps.

This benefit was calculated using a unit pavement damage cost on urban interstates of $0.001 per auto VMT in 2000 dollars[11], adjusted to $0.00157 in 2021 dollars per VMT using CPI-U,[4] and to $0.00094 in 2021 dollars per PMT after dividing by the suggested AVO for all travel purposes of 1.67.[3] Table 7 shows the avoided road wear and tear benefits for each alternative during the different 30-year Operating Periods. Since these PMT would be traveled by rail under the “Build” scenario, “No Build” costs are equal to the difference between “No Build” and “Build” (zero costs), representing the avoided road wear and tear benefits. Note that rail infrastructure wear and tear is captured in the Project O&M costs.

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[11] USDOT *Cost Allocation Study*, 2000 https://www.fhwa.dot.gov/policy/hcas/final/five.cfm

Table 7: Avoided Road Wear and Tear Benefits, undiscounted 2021 dollars

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2026	$3,107	—	—	—	—	$66
2027	$3,107	$5,394	—	$8,864	$5,325	$66
2028	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2029	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2030	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2031	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2032	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2033	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2034	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2035	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2036	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2037	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2038	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2039	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2040	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2041	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2042	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2043	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2044	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2045	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2046	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2047	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2048	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2049	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2050	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2051	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2052	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2053	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2054	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2055	$3,107	$5,394	$9,442	$8,864	$5,325	$66
2056	—	$5,394	$9,442	$8,864	$5,325	—
2057	—	—	$9,442	—	—	—

Source: Cambridge Systematics, Inc.

6.3 AVOIDED CONGESTION COSTS BENEFITS

The Project will divert some travel from roadways onto rail, decreasing automobile traffic. Avoided congestion costs benefits were estimated by following the USDOT BCA Guidance recent addition of congestion monetization rates per VMT.[12] Given how the different alternatives travel through several urban and rural settings, the “All Locations” values per VMT was used, equal to $0.109 in 2021 dollars.[3] This value was later converted to a per-PMT rate by dividing it by the average vehicle occupancy (AVO) rate for all purposes, equal to 1.67. Consequently, a value of $0.065 was multiplied by each alternative's annual PMT and added for each year during the 30-year Operating Period of each alternative. Table 8 shows the total congestion costs for the "No Build" scenario. Since these PMT would be traveled by rail under the "Build" scenario, "No Build" costs are equal to the difference between "No Build" and "Build" (zero costs), representing the avoided congestion costs benefits.

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[12] Congestion cost details can be found in the Benefit Cost Analysis Guidance in Table A-14.

Table 8: Avoided Congestion Costs Benefits, undiscounted 2021 dollars

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2026	$215,202	—	—	—	—	$4,593
2027	$215,202	$373,620	—	$613,983	$368,860	$4,593
2028	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2029	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2030	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2031	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2032	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2033	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2034	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2035	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2036	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2037	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2038	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2039	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2040	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2041	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2042	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2043	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2044	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2045	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2046	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2047	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2048	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2049	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2050	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2051	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2052	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2053	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2054	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2055	$215,202	$373,620	$654,005	$613,983	$368,860	$4,593
2056	—	$373,620	$654,005	$613,983	$368,860	—
2057	—	—	$654,005	—	—	—

Source: Cambridge Systematics, Inc.

6.4 AVOIDED EMISSIONS BENEFITS

Travel diverted onto trains will reduce automobile tailpipe emissions. Emission damage costs are a function of running emission rates per pollutant (which are a function of travel speed and vehicle type), unit damage costs per pollutant, and changes in vehicle miles traveled (VMT) per vehicle type. Analyzed greenhouse gases (GHG) included carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NO_X), particulate matter (PM_{10}), sulfur oxides (SO_X), volatile organic compounds (VOC), and fine particulate matter ($PM_{2.5}$). The assessment of the net emission cost savings due to passengers riding the *Northern Tier* rail alternatives instead of private vehicles includes the following steps:

- "No Build" scenario:
  - An average free-flow speed of 55 miles per hour was assumed for private vehicles. This input was used to obtain the emission rates per VMT for private vehicles following the "Passenger Cars" California B/C Model Version 8.1 for Year 2024.[13] These emission rates are shown in Table 9.
  - PMT were converted to VMT using the 1.67 suggested AVO rate.[3]
- "Build" scenario:
  - The emission rates per VMT from the "Passenger Rail" California B/C Model Version 8.1 were used, by computing the average between the Year 2010 and Year 2040 models.[13] The resulting emission rates are also shown in Table 9.
  - Northern Tier VMT were estimated using the system service assumptions: 10 daily trips, multiplied by a 365-day annualization rate, and multiplied again by each alternative's respective mileage. Individual alternative results are shown in Table 10.
  - For Alternative 3, no emissions were assumed due to the electrification scenario it entails.
- Monetization:
  - After multiplying both scenarios' emission rates by the corresponding vehicle type VMT, total emissions were monetized using the rates provided by the USDOT BCA Guidance[3], and assuming monetization rates after 2050 remain constant. Because of the unavailability of CO, VOCs, and PM_{10} monetization rates, those from California Air Resources Board EMFAC 2021 for rural areas were used instead.[14] Monetization rates for 2026 and 2050, first and last year of the data source, are shown in Table 11.
  - Resulting avoided emissions benefits for all GHG except CO_2 are included in Table 12, while resulting avoided emissions benefits for CO_2 are shown in Table 13. Separating these benefits responds to the differential three-percent discount rate that is used for CO_2 emissions.

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[13] https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/data-analytics-services/transportation-economics

[14] https://arb.ca.gov/emfac/

Table 9: Emission Rates by Pollutant and Vehicle Type (g / VMT)

Vehicle Type	CO	CO_2	NO_X	PM_{10}	SO_X	VOC	$PM_{2.5}$
Passenger Car (55 mph)	0.833	315.190	0.067	0.001	0.003	0.014	0.001
Passenger Train (2010-40)	4.260	2,754.880	50.490	1.020	—	—	1.020

Source: California B/C Model Version 8.1.

Table 10: Northern Tier VMT by Alternative

Passenger Rail Service	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Number of Daily One-Way Trips	10	10	10	10	10	10
Total One-Way Mileage (mi)	142	142	142	142	222	93
Annualization Rate (days)	365	365	365	365	365	365
Passenger Rail VMT	518,300	518,300	518,300	518,300	810,300	339,450

Source: Cambridge Systematics, Inc.

Table 11: Initial and Final Monetization Rates by Pollutant

Year	CO_2	NO_X	SO_X	$PM_{2.5}$	CO	VOC	PM_{10}
2026	$60.00	$17,500	$47,800	$852,100	$88.12	$1,222.665	$128,545.05
2050	$88.00	$18,900	$51,300	$907,600	$88.12	$1,222.665	$128,545.05

Source: USDOT BCA Guidance, 2023; California Air Resources Board EMFAC, 2021.

Table 12: Avoided Emissions Benefits (except CO_2)

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2026	-$16,717	—	—	—	—	-$12,091
2027	-$17,019	-$10,885	—	-$6,079	-$21,616	-$12,309
2028	-$17,281	-$11,054	$14,917	-$6,177	-$21,949	-$12,496
2029	-$17,587	-$11,251	$15,179	-$6,288	-$22,339	-$12,718
2030	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2031	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2032	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2033	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2034	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2035	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2036	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2037	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2038	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2039	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2040	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2041	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2042	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2043	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2044	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2045	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2046	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2047	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2048	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2049	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2050	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2051	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2052	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2053	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2054	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2055	-$17,852	-$11,422	$15,402	-$6,386	-$22,675	-$12,908
2056	—	-$11,422	$15,402	-$6,386	-$22,675	—
2057	—	—	$15,402	—	—	—

Source: Cambridge Systematics, Inc.

Table 13: Avoided GHG Emissions Benefits (CO_2 only)

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2026	$35,449	—	—	—	—	-$275
2027	$36,040	$64,209	—	$106,555	$62,437	-$280
2028	$36,631	$65,262	$117,251	$108,301	$63,460	-$285
2029	$37,222	$66,315	$119,143	$110,048	$64,484	-$289
2030	$38,403	$68,420	$122,925	$113,542	$66,531	-$298
2031	$38,994	$69,472	$124,816	$115,289	$67,554	-$303
2032	$39,585	$70,525	$126,707	$117,035	$68,578	-$307
2033	$40,176	$71,578	$128,598	$118,782	$69,601	-$312
2034	$40,766	$72,630	$130,489	$120,529	$70,625	-$317
2035	$41,357	$73,683	$132,381	$122,276	$71,649	-$321
2036	$42,539	$75,788	$136,163	$125,769	$73,696	-$330
2037	$43,130	$76,841	$138,054	$127,516	$74,719	-$335
2038	$43,721	$77,893	$139,945	$129,263	$75,743	-$340
2039	$44,311	$78,946	$141,836	$131,010	$76,766	-$344
2040	$44,902	$79,998	$143,727	$132,757	$77,790	-$349
2041	$46,084	$82,104	$147,510	$136,250	$79,837	-$358
2042	$46,675	$83,156	$149,401	$137,997	$80,860	-$363
2043	$47,265	$84,209	$151,292	$139,744	$81,884	-$367
2044	$47,856	$85,262	$153,183	$141,491	$82,908	-$372
2045	$48,447	$86,314	$155,074	$143,237	$83,931	-$376
2046	$49,629	$88,419	$158,857	$146,731	$85,978	-$386
2047	$50,220	$89,472	$160,748	$148,478	$87,002	-$390
2048	$50,810	$90,525	$162,639	$150,225	$88,025	-$395
2049	$51,401	$91,577	$164,530	$151,971	$89,049	-$399
2050	$51,992	$92,630	$166,421	$153,718	$90,072	-$404
2051	$51,992	$92,630	$166,421	$153,718	$90,072	-$404
2052	$51,992	$92,630	$166,421	$153,718	$90,072	-$404
2053	$51,992	$92,630	$166,421	$153,718	$90,072	-$404
2054	$51,992	$92,630	$166,421	$153,718	$90,072	-$404
2055	$51,992	$92,630	$166,421	$153,718	$90,072	-$404
2056	—	$92,630	$166,421	$153,718	$90,072	—
2057	—	—	$166,421	—	—	—

Source: Cambridge Systematics, Inc.

6.5 PROPERTY VALUE INCREASE BENEFITS

Properties surrounding the proposed station areas will see an increase in value resulting from this new transportation service. A six percent increase in property values was estimated for the involved station surrounding areas in each alternative. These windfall increases in property values are assumed to take place upon the inauguration of each of the alternatives, and are claimed in the corresponding first year of the Operating Period. Only station areas within the North Adams - Fitchburg segment were analyzed. Table 14 shows the current real estate total values for each station, the resulting value after a six-percent increase, and the difference between both scenarios. The right hand-side of the table indicates whether the station is included (1) or not (0) in each alternative.

Table 14: Change in Total Land Value by Station Area

Town / City	Current Total Value (2021 dollars)	Total Value with 6% Premium	Δ Property Value	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
North Adams	$226,700,595	$240,302,631	$13,602,036	1	1	1	1	1	1
Buckland	$91,695,469	$97,197,197	$5,501,728	0	0	0	1	0	0
Shelburne	$54,741,248	$58,025,723	$3,284,475	0	0	0	1	0	0
Greenfield	$285,912,728	$303,067,492	$17,154,764	1	1	1	1	1	1
Athol	$233,310,147	$247,308,756	$13,998,609	0	0	1	1	0	1
Gardner	$172,136,111	$182,464,278	$10,328,167	0	0	0	1	0	0

Source: UMass Donahue Institute, Cambridge Systematics, Inc.

After station values are assigned to the applicable alternatives, Table 15 shows the assumed property value windfall increases corresponding to each alternative upon their beginning of operations. Note that Fitchburg potential increases were omitted due to the existing rail connection to Boston.

Table 15: Property Value Increase Benefits by Alternative, undiscounted 2021 dollars

Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2026	$30,756,799	—	—	—	—	$44,755,408
2027	—	$30,756,799	—	$63,869,778	$30,756,799	—
2028	—	—	$44,755,408	—	—	—

Source: Cambridge Systematics, Inc., based on UMass Donahue Institute.

7 *PROJECT COSTS*

Costs of this project include the capital costs of upgrading existing infrastructure and building new infrastructure where needed, and the cost of running the service (e.g., fuel, crew salaries, etc.). A breakdown of these costs is presented below.

7.1 CAPITAL COSTS

Construction of the Project requires significant capital investment, which is typical of rail projects. Elements such as new railroad ties, rail, base stabilization, and bridge and tunnel work are typical components of rail upgrade projects. Capital costs for each of the six Northern Tier rail alternatives are shown in Table 16. The most expensive alternative is Alternative 3 (due to electrification), while the least is Alternative 1 (a lower investment alternative). Costs were uniformly apportioned during each alternative's respective implementation period.

Table 16: Project Capital Costs by Alternative, undiscounted thousands of 2021 dollars

Year	Capital Costs (thousands of 2021 dollars)					
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
2023	$221,020	$297,481	$443,975	$301,164	$372,065	$393,246
2024	$221,020	$297,481	$443,975	$301,164	$372,065	$393,246
2025	$221,020	$297,481	$443,975	$301,164	$372,065	$393,246
2026	—	$297,481	$443,975	$301,164	$372,065	—
2027	—	—	$443,975	—	—	—
Total Costs	**$663,060**	**$1,189,923**	**$2,219,875**	**$1,204,655**	**$1,488,260**	**$1,179,738**

Source: HNTB, adjusted to 2021 dollars using CPI-U.

7.2 OPERATING AND MAINTENANCE COSTS

O&M costs include the cost of running the service and include elements such as fuel (diesel or electricity), wages for train crew and regular maintenance of tracks. O&M costs for each of the six Northern Tier rail alternatives are shown in Table 17. Note that O&M Costs are the same for alternatives 1, 2, 3, and 4. O&M costs for alternatives 5 and 6 differ because Alternative 5 extends beyond North Adams to the west (more expensive), while Alternative 6 only reaches Fitchburg to the east (less expensive). This is related to annual revenue miles having been used as the core input for O&M cost estimates.

Net costs (or net savings) had to be calculated for each alternative against the No Build scenario. Operating and Maintenance costs for each alternative also took into account the personal vehicle operating costs avoided for passengers using rail instead of driving a personal vehicle, as shown in Table 17. These estimates are the product of the USDOT BCA Guidance suggested vehicle operating cost for light duty vehicles, equal to $0.46 per VMT in 2021 dollars,[3] and the annual number of VMT for passengers not able to choose the rail option under the "No Build" scenario. VMT are estimated by dividing each alternative's annual PMT by the USDOT BCA Guidance suggested AVO rate for all travel purposes of 1.67 passengers per vehicle.[3] Note that unlike O&M costs, which depend on service statistics, the "No Build" cost of travel is affected by the ridership forecasts and each marginal PMT that would divert modes.

Table 17: Project O&M Costs and O&M Net Costs by Alternative, undiscounted millions of 2021 dollars

Annual Cost (Millions of 2021 dollars$)	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Costs	$29.6	$29.6	$29.6	$29.6	$46.4	$19.31
Vehicle Operating Costs ("No Build")	-$1.5	-$2.6	-$4.6	-$4.3	-$2.6	-$0.03
O&M Net Costs	**$28.1**	**$27.0**	**$25.0**	**$25.3**	**$43.8**	**$19.3**

Source: HNTB, Cambridge Systematics, Inc. Note that some values may not add up due to rounding.

8 SUMMARY OF RESULTS

8.1 EVALUATION MEASURES

The BCA converts potential gains (benefits) and losses (costs) into monetary units and compares them. The following benefit-cost evaluation measures are included in this BCA:

- **Net Present Value (NPV)**: NPV compares the net benefits (benefits minus costs) after being discounted to present values using the discount rate. The NPV provides a perspective on the overall dollar magnitude of cash flows over time in today's dollar terms.
- **Benefit Cost Ratio (BCR)**: The present value of incremental benefits is divided by the present value of incremental costs to yield the BCR. The BCR expresses the relation of discounted benefits to discounted costs as a measure of the extent to which a project's benefits either exceed or fall short of the costs.

8.2 BCA RESULTS

This section provides the overall results of the BCA, which combine the monetary gains from the Project benefits and the monetary Project costs. Table 18 presents the Net Present Value (NPV), or the overall cash value of the benefits minus the costs, and the Benefit Cost Ratio (BCR), or the value of the overall benefits value divided by the costs.

Table 18: Massachusetts Northern Tier Rail Alternatives Benefit-Cost Analysis Summary, discounted millions of 2021 dollars

BCA Metric	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5
Safety Benefits	$2.3	$3.8	$6.1	$6.2	$3.8	$0.1
Avoided Road Wear and Tear	~$0.0	$0.1	$0.1	$0.1	$0.1	~$0.0
Avoided Congestion	$2.0	$3.3	$5.4	$5.4	$3.3	$0.1
Avoided Emissions (except CO_2)	- $0.2	- $0.1	$0.1	- $0.1	- $0.2	- $0.1
Avoided Emissions (CO_2 only)*	$0.8	$1.3	$2.4	$2.2	$1.3	~$0.0
Property Value Increase	$21.9	$20.5	$27.9	$42.6	$20.5	$31.9
Total Benefits	- $238.8	- $209.5	- $164.5	- $167.0	- $358.7	- $150.6
Total Costs	$542.1	$941.7	$1,701.3	$953.4	$1,177.8	$964.5
NPV	- $780.9	- $1,151.2	- $1,865.8	- $1,120.4	- $1,536.5	- $1,115.1
BCR	- 0.44	- 0.22	- 0.10	- 0.18	- 0.30	- 0.16
O&M Net Savings	- $265.7	- $238.5	- $206.5	- $223.5	- $387.4	- $182.5

* Discounted at 3% rate

9 SENSITIVITY ANALYSIS: FIFTY-PERCENT CAPITAL AND O&M COST REDUCTION

Table 19 shows the results from halving capital and O&M costs. The Net Present Value range under these reduced cost circumstances ranges from -$370 million to -$893 million.

Table 19: Impact of Halving Capital and O&M Costs to Break-Even Ridership Multipliers (millions of 2021 dollars)

BCA Metric	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
O&M Net Savings	-$125.68	-$107.58	-$84.20	-$92.59	-$182.21	-$91.08
Safety Benefits	$2.30	$3.80	$6.10	$6.20	$3.80	$0.10
Avoided Road Wear and Tear	~$0.0	$0.10	$0.10	$0.10	$0.10	~$0.0
Avoided Congestion	$2.00	$3.30	$5.40	$5.40	$3.30	$0.10
Avoided Emissions (except CO_2)	-$0.20	-$0.10	$0.10	-$0.10	-$0.20	-$0.10
Avoided Emissions (CO_2 only)*	$0.80	$1.30	$2.40	$2.20	$1.30	~$0.0
Property Value Increase	$21.90	$20.50	$27.90	$42.60	$20.50	$31.90
Total Benefits	-$98.88	-$78.68	-$42.20	-$36.19	-$153.41	-$59.08
Total Costs	$271.05	$470.85	$850.65	$476.70	$588.90	$482.25
NPV	-$369.93	-$549.53	-$892.85	-$512.89	-$742.31	-$541.33
BCR	-$0.36	-$0.17	-$0.05	-$0.08	-$0.26	-$0.12

* Discounted at 3% rate